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Secretariat, Ministry of Business, Innovation and Employment
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via email to energymarkets@mbie.govt.nz

Dear Miriam

Electricity Price Review

One thing is certain, New Zealand's energy future will be more disrupted, more consumer oriented, more technology-enabled, more resilient, more democratic, more sustainable and, ultimately, more about choice.

The key trends being observed in so many other sectors, of enhanced customer experience and greater value enabled by technology, are now increasingly true of electricity. It's not a matter of if, it's a matter of when.

We strongly believe the magnitude of these changes and the levels of investment globally in the sector risks being under-appreciated in New Zealand policy and regulatory settings, in part because of an outdated belief that the status quo will serve customers going forward.

As a country, if we do not invest in the disruptive technology being trialled and rapidly deployed around the world, we risk leaving consumers at the will of those companies who wish to perpetuate current models and cost structures over embracing change and new technologies.

Customers need to be at the heart of the Panel's recommendations.

Globally, the electricity industry is undergoing a fundamental shift - from one that has been for many decades centrally planned and coordinated, with energy produced traditionally by very large assets often far away from consumers, to one where customers are progressively gaining control and choice (including through locally distributed generation and storage).

Consumers, not the industry, will dictate the pace and direction of this disruption, and if the experience of other sectors such as media, taxis, entertainment or telecommunications is a guide, this disruption will start slowly and relentlessly accelerate, inevitably catching businesses by surprise, particularly where those businesses seek to protect their traditional models against threat. Such acceleration will only be reinforced by the broader trend of all parts of the economy seeking to digitise.

While New Zealand is proud of its historic, largely pre-Bradford reform investments in renewable energy and relative security of supply, it's hard to mount a substantive argument that the status quo has delivered all that it possibly could for consumers, or that it will be fit for purpose for the future. While the reforms were considered best-practice at the time, comparable electricity sector reforms in other jurisdictions such as the United Kingdom and Australia are increasingly being questioned, including the competition implications of vertical integration.

20 years of reform has delivered increased cashflows to generator/retailers at the expense of customers.

No matter which way we look at the Panel's figure 20 in the Issues Paper – it highlights that the existing model has delivered significantly larger cashflows for generators and retailers than it has benefits for consumers in the 20 years since the Bradford industry reforms.

We believe this places an even greater onus on the Panel to be responsive to the powerful forces that are shaping energy production and use, and to actively help shape policy settings that incentivise new energy forces and investment for the benefit of consumers.

The Panel's recommendations need to enable New Zealand's energy consumer revolution. In some cases, customers will be seeking out new solutions offered by any number of domestic or international providers. But in many other cases, new solutions will be delivered by those industry participants prepared to authentically focus on customers and provide new solutions (whether at a customer level or using technology to change the way they currently undertake their business).

It is increasingly unrealistic to assume the industry will have the same configuration in 20, even 10, years from now. The Review needs to be concerned with those incumbents (at whatever level of the supply chain) who seek to protect their positions, slow adoption, and who actively seek to preclude those companies who want to deliver change for better customer outcomes.

Slow adoption of disruptive forces will only load unnecessary cost onto New Zealand consumers, hinder the essential decarbonisation of our economy, and make New Zealand less competitive on an international basis.

Like in so many industries, new thinking and new technologies are ready to reset energy pricing.

The solutions of tomorrow will not be to "build more", "transmit more" and "allocate costs differently". The language of the industry is changing to recognise "virtual power plants", "smart networks which utilise algorithms to flatten the peak", harnessing "deep data analytics" to understand fast-changing customer behaviour, "network optimisation", "peak-capping technology", and "energy efficiency investments" to reduce customer consumption and/or costs.

The increasing possibilities of new technology enable new and exciting investments and approaches that can substitute billions of dollars of traditional generation and grid investment for consumers and the New Zealand economy, helping to mitigate some of the energy equity issues the Panel have identified.

Government and the Panel have the opportunity to take a global leadership position in creating change to benefit customers and new competitive forces.

The recommendations Vector makes in this submission seek bold solutions that provide greater transparency and enable disruption for the benefit of consumers. It is consumer-led disruption that will promote a step-change in cost structures for the benefit of all consumers.

Therefore, the challenge remains for the Panel to ensure this Review considers the industry truly from a consumer's perspective.

Kind regards

Simon Mackenzie
Group Chief Executive Officer

ELECTRICITY PRICE REVIEW

OCTOBER 2018

Vector

CONSUMERS

DISRUPTION WILL BENEFIT CONSUMERS, MORE THAN CURRENTLY APPRECIATED

The recommendations of the Panel need to encourage and enable new businesses and new energy technologies to flourish, disrupt, challenge, compete and create fresh customer solutions.

Initiatives much broader than the traditional energy model need to be welcomed, embraced and incentivised. Data analytics, smart load control, consumer owned distributed generation, dynamically controlled smart EV charging, and virtual power plants are just some of the terms needing to be embedded into forward looking recommendations and a "smarter with less" ethos.

COMPLETE CUSTOMER BILL TRANSPARENCY - INCLUDING ALL ITEMISED COMPONENTS - OVERDUE

A key enabler of a more consumer-centric future will be greater transparency in the sector. In particular, it means customers having complete bill clarity and transparency and ease of access to their own historic smart metering data (neither of which are assured today).

A host of new opportunities exist once a consumer can more easily share their own data with third parties of their choice and beyond their incumbent retailer including; more competitive and dynamic pricing, energy efficiency analysis, demand aggregation, bundled or integrated service options, load control device options and tailored pricing options.

Bill confusion is also a key factor explaining why so many New Zealand customers are not actively participating in the market. Without bill transparency, the likelihood of customers understanding their choices and shopping around for the best deal diminishes. In the energy market, the volume of switching alone - much of which can be attributed to relocations - does not necessarily indicate a healthy market or good outcomes for consumers, particularly in the context of a two-tier retail market.

Ensuring the break down and specification of each component of the energy bill will be a big step toward consumers better understanding their costs and the drivers of their bill. The lack of transparency and resulting consumer confusion may also be one of the reasons why many consumers, particularly vulnerable consumers, have been financially penalised by the common practice "prompt payment discount".

Transparency will also enhance consumer confidence, for example that a retailer has passed-through any reduction in lines or transmission charges. At present there exists neither the regulatory obligation to do so, nor the transparency to check whether retailers have delivered such benefits through to customers.

RECOMMENDATION #1

Provide consumers with complete bill transparency of energy bills so that customers can accurately see all components of the bill separately – including itemised energy, transmission, distribution, retail, tariffs, late payment fees and regulatory costs. Furthermore, supplement bill transparency with real and fast access to historical smart metering data for customers, or their nominated agents, to enable greater consumer choice and place energy cost management back into the hands of consumers.

RIGHT SIZING TARIFFS

Vector welcomes the Panel's strong focus on energy hardship. The lowest-hanging fruit for addressing energy poverty is ensuring that consumers are on the right tariffs. This applies at both the lines charge level (low fixed user charge or not) as well as consumers being on the optimal retail plan.

We are aware of a significant number of Auckland customers (15%+) who are not placed on the optimal lines charge and therefore could be paying at least $121 per annum more than they should be. Only retailers are permitted to switch consumers between low-fixed user and standard lines charges. Much greater enforcement of this obligation on retailers is overdue and has been repeatedly raised by Vector in communication with retailers.

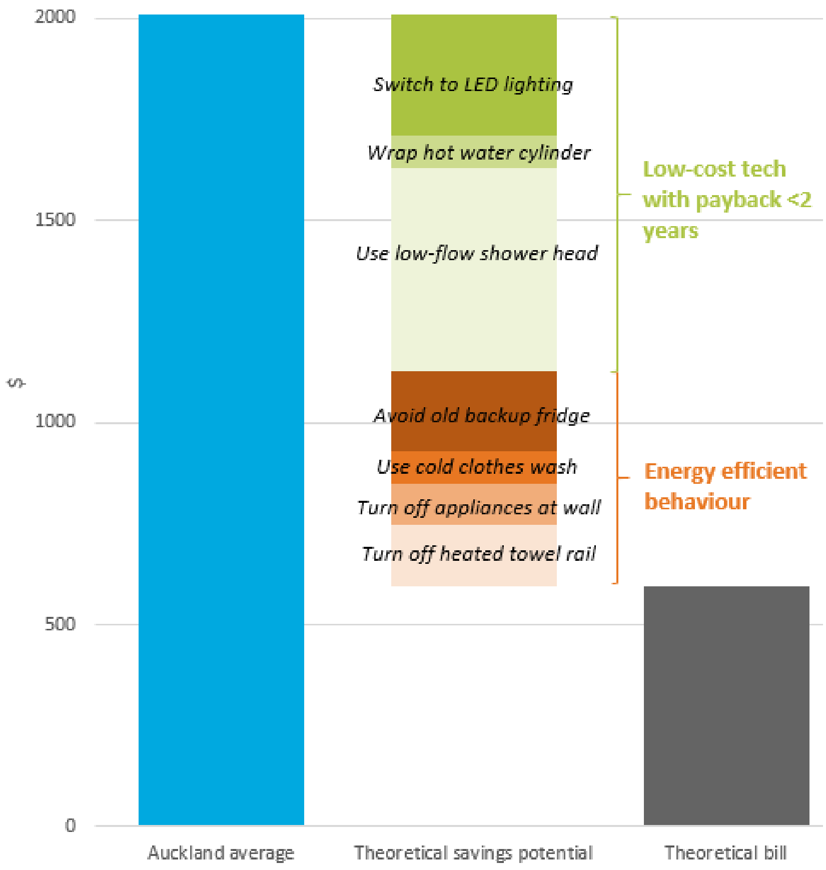
For optimal retail tariff options there would also appear significant scope to provide a greater obligation on retailers to inform consumers about cheaper tariff options and make it easy for consumers to switch so that they are not left on old expensive tariffs. Such an obligation could either be applied to prices across the market, or at least among pricing offered by their existing retailer.

Much has been submitted on the inequity of the so-called "prompt payment discount". We encourage the Panel to swiftly address the issue which acts as a severe penalty for late payment and which is disproportionate to any costs borne by the retailer.

THE IMPORTANCE OF ENERGY EFFICIENCY TO ALLEVIATE ENERGY HARDSHIP

In addition to examining electricity prices and optimal tariffs for consumers, the Panel will need to also be alert to the volume side of the energy bill equation. Energy efficiency initiatives, be those by industry, government or customers themselves can deliver meaningful (and permanent) energy cost reduction.

To assist the Panel, we have prepared the following diagram showing the theoretical cost savings from publicly available information (including EECA) particularly around low-cost technology improvements or energy efficient behaviour.



Industry participants and regulators can actively support energy efficiency and reduced electricity bills by; supporting EECA's work programme, encouraging energy literacy in schools, providing energy efficient lightbulbs to vulnerable consumers, and supporting home insulation programmes. We believe EDBs should also be encouraged and enabled to put solar PV and household batteries into their regulated asset base for vulnerable consumers in order to access renewable energy and better manage their electricity requirements, and incentivise load control technology to flatten peak demand and reduce network costs.

Vector is happy to share analysis with the review panel, which highlights that low-income consumers have significantly higher electricity usage. By way of example, our data analysis across Auckland households reveals the most deprived households have benefited least from the 1% per annum average decline in energy consumption over the last 10 years and the efficiency gap between poorer and wealthier homes is estimated at 7kWh/m2 ($2/m2).

RECOMMENDATION #2

Broaden energy hardship proposals and initiatives beyond simple tariff reform, recognising that energy bills are made up of a combination of price and volume, and that efficiency matters. There are a number of practical ways, ranging from low-cost to high-cost, to deliver permanent energy efficiency gains for households. Propose reforms to (1) ensure retailers are obliged to place consumers on the optimal tariff and prohibit late payment penalties and (2) clarify the ability of EDBs to invest in energy efficiency investments such as LEDs, winter heating control etc. where long-term consumer interests can be demonstrated.

Pono Home is an excellent example of a targeted and proven solution to energy affordability, currently underway in the United States. Pono Home provides free green home audit/upgrades to assess what is causing consumers to spend too much on their utilities bill via a 100-point checklist. This includes an assessment of appliances, electronics, lighting, building envelop, leaks, and much more.

TWO-TIER RETAIL MARKET

With nearly half of New Zealand consumers not having switched retailers at any point over recent years (and therefore potentially paying hundreds of dollars over and above a competitive market price for their energy), we do not consider this to be a market that is delivering optimally for consumers. As recently found in Australia and the United Kingdom, New Zealand now clearly has a two-tier electricity retail market which warrants policy intervention.

A two-tier market structure means that new entrants and smaller retailers are vying primarily for the 'active' customer segment which, by definition, is likely to be especially price sensitive and may offer only relatively low margins.

Larger incumbent retailers are well-placed to charge (or keep on costly legacy tariffs) those disengaged customers prices that exceed –significantly – the long-run cost of supplying the services, without concern about losing those customers to rivals.

In short, while new entrants may be able to acquire lower-value price-sensitive customers quite quickly by offering cheap deals, attracting the disengaged customers of incumbents is far more difficult which serves to insulate incumbent retailers from genuine competition across all their customer base, and ensures that many consumers miss out on available lower prices. This is a troubling retail practice that has been identified and addressed in other markets such as telecommunications.

Regulatory rules on "saves and win-backs" would appear a last bastion of defense for incumbent retailers. Regulatory inattention to the true competitive impact of such rules must now be called out and credible protections introduced, such as a moratorium period.

RECOMMENDATION #3

Follow the lead of both the UK and Australia in acting on the existence of a two-tier electricity retail market. Innovative policy options, such as those being implemented in the UK and Australia, are needed to assist those who for whatever reason are not actively participating in the market and taking advantage of the best available offers. At a minimum, a much greater onus must rest on retailers to be transparent with their customers about more economical pricing plan alternatives. Saves and win-back rules need to be reformed as they serve as a structural impediment for new entrant retailers to challenge incumbent retailers.

INCREASES IN ELECTRICITY PRICES

We have some concerns regarding the Panel's assessment of recent price changes. The electricity industry experienced significant change during the 1990s, which makes comparisons during (and prior to) that period difficult. The challenge of obtaining accurate data is evident in the Panel's reliance on a Trustpower presentation, which itself is missing data from 1990 to 1999. We do not accept Trustpower's information as the nature of the industry through this period. This was at a time that the industry was very integrated so, at best, it looks like a guess.

The Panel should instead focus its analysis from 2000 onwards (when information disclosure requirements were first introduced on EDBs). PwC analysis of the change in residential bill components from 2002 to 2017 shows that distribution charges have increased by an average of 1.4 per cent per year in real terms, which is the lowest rate of increase of the five components of the bill.

Given the issues with historic data accuracy, we question whether the Panel's estimate that distribution charges to householders increased by the level the Issues Paper reports. We accept that there has been a re-allocation of costs from business to residential customers, but this reflects the unwinding of previous cross-subsidies and the fact that residential customers make a larger contribution to peak demand. We also note that in Vector's case our pricing methodology is fully disclosed. Furthermore in 2008, this was endorsed via an administrative settlement with the Commerce Commission and pricing across the wider Auckland region and which resulted in rebalancing lines charges at the request of the Commerce Commission.

Finally, the Panel should also take into account the payment of dividends to consumers by trust-owned EDBs.

CUSTOMER ENGAGEMENT

Actively creating transparency, educating consumers, and embracing consumer-centric technology solutions that can understand consumer preferences and implement them, will be central to enabling a stronger consumer voice.

EDBs have a central role to play in engaging with customers. Not only does this relate to network issues like connections, outages and reliability but also choices customers now have in relation to their energy purchase and usage. Increasingly, as Vector is experiencing in the context of Auckland growth, lines businesses must engage regularly with customers to understand needs and trends to build the least cost, high efficiency network.

With anticipated disruption at a retail level, such as multiple trader relationships, global energy management systems and peer-to-peer trading, EDBs will remain the one common and constant point for customers on these network and related issues. EDBs are embedded in their communities reinforcing their accessibility and natural point of connection in the eyes of consumers.

INDUSTRY

GENERATION

Fundamental questions remain about the degree of competition in the wholesale market, most obviously whether margins are reasonable and consistent with what one would expect to observe under workable competition.

Most recently, Dr Stephen Poletti of the University of Auckland has demonstrated multi-billion-dollar market power rents being achieved over recent years by generators, including the three majority Government-owned gentailers. Dr Poletti used computer modelling to simulate how energy traders in generator firms behave in the wholesale market, and compared it to how they would behave if the market was competitive – that is, if generators were forced to sell power at cost.

Dr Poletti's research revealed that market power rents – the level of excess profits that generators earn, totalled $5.4 billion over seven years 2010-2016.

This finding and associated methodology was peer reviewed by Professor Derek Bunn of the London Business School. Professor Derek Bunn is the author of over 200 research papers and 10 books in the areas of forecasting, decision analysis and energy economics. He is currently a member of the UK Government Panel of Technical Experts for the Electricity Market and he also serves as an independent member of the industry panel that oversees the UK wholesale electricity trading.

This research is the most detailed and comprehensive analysis we are aware of which evidences a problem of significant market power that is costing New Zealand consumers hundreds of millions of dollars every year.

We are deeply concerned that the Panel elected not to acknowledge the independent research of Dr Poletti in its Issues Paper. The scale of market rents that Dr Poletti found in the New Zealand generation market are alarming and make nearly all other issues the Panel are examining pale into insignificance.

It was similarly disappointing that the EA was happy to dismiss the most recent research and views of Dr Poletti and the London Business School within hours of it being published. As the regulator consumers rely on to provide confidence around competition in the generation market, the EA needs to be willing and open to engage with research from one of New Zealand's leading universities and a finding that is of significant impact to New Zealand consumers. The most concerning issue with this is how a regulator could come to a view on such a critical issue in such a remarkably short space of time.

Furthermore, although the EA has explored various market indicators in recent years (including the existence of net pivotal trading periods), it has not sought to repeat the more fundamental comparison between actual prices and competitive benchmarks, performed by Dr Poletti in 2012 and now in 2018.

The EA's enforcement of existing rules on Undesirable Trading Situations (UTS) have been notably weak, with two recent investigations closed without penalty despite clear evidence of misbehaviour.

Finally, neither the EA or the Commerce Commission has ever examined the potential for market power to be exercised in other conceivable ways such as the coordinated exercise of substantial market power or tacit coordination – both of which could result in prices above competitive levels. The wholesale market is essentially a 'repeated game' and, through those ongoing interactions, it is conceivable that some participants have found ways to coordinate their conduct in ways that result in higher prices.

The Review represents an important and valuable opportunity to provide clarity on the above matters. We recognise that robustly answering questions of margin are not straightforward and it would appear the Panel has elected not to resource the examination of such fundamental questions. In light of this, enduring structural and transparency-based solutions ought to be credibly recommended by the Panel, particularly given the importance to the overall objective of the Review.

Finally, while there will always be differences across countries that will affect the cost of renewable investment, we think the Panel should look again at its $80 LRMC in Figure 14 to ensure it is current, given the rapidly declining cost curves for these technologies. Many jurisdictions are reporting new generation costs lower than the Issues Paper assumes.

RECOMMENDATION #4

Take immediate steps to address the exploitation of market power by generators in the NZ wholesale market. This could be achieved through: (1) tightening up the existing rules for defining and mitigating "Undesirable Trading Situations" combined with a step-change in enforcement activity. We suggest that responsibility for enforcement of competition and market power rules should sit with the Commerce Commission as New Zealand's lead competition regulator, rather than the EA; (2) looking at options for wholesale market re-design that have been applied overseas, such as the introduction of capacity payments combined with cost-based bidding regulation; (3) reducing concentration in the generation sector through (at least) expanding the current "virtual asset swap" arrangements, and possibly the creation of a new SOE generator as considered in the Government's 2009 market review (4) review the asset revaluation practices of majority-Government owned gentailers (Mercury, Meridian and Genesis) as compared to privately held gentailers (Contact and Trustpower) to understand why the practices of each have differed so remarkably; and (5) ensure whoever is the market regulator/monitoring agency going forward has modern sophisticated market monitoring technology that seeks to identify any irregularities with meaningful enforcement processes.

VERTICAL INTEGRATION AND THE HEDGE MARKET

New Zealand stands out among international electricity markets as having some of the lowest levels of contract market liquidity and highest levels of vertical integration between generation and retail.

Liquidity indicators such as bid-offer spreads and contract churn rates are an order of magnitude below markets such as the UK, PJM and even Australia, where the ACCC recently raised significant concerns regarding vertical integration and contract market performance.

A poorly functioning hedge market creates a significant barrier to entry and expansion of independent retailers. In addition, the opaque financial accounts of vertically integrated players mean that there is little information regarding the split between wholesale and retail margins and how this has changed over time. This undermines confidence in the market and (as the Panel has already discovered) makes it very difficult to assess margins and profitability accurately.

RECOMMENDATION #5

Improve the functioning of the hedge market and provide consumers and independent retailers with greater confidence in the operations of New Zealand's large generator-retailers through a reset of transparency, liquidity and structural changes. This can be achieved through: (1) regulated accounting and operational separation of (at least) majority Government owned Gentailers to allow returns to be transparent to all; and (2) providing much needed liquidity in derivative products through mandatory market-making obligations on the large gentailers and a requirement for internal hedging between generation and retail arms of the same company to occur on market.

Vector

TPM

The TPM review process has fallen well short of regulatory best practice in almost every respect. Key issues have included: lack of a coherent problem definition from the start; lengthy delays; poor stakeholder engagement; and failure to adequately address comprehensive criticism of the proposals from the industry and experts.

We continue to believe the EA's proposed TPM reform significantly ignores the benefits grid-connected generators receive from being able to transport their product across the country. The EA's proposed TPM in fact results in generators paying even less than the current 18% of total TPM charges. The proposed TPM will result in all generators funding only approximately 7% for transmission grid charges, and burdening consumers to fund the remaining 93%.

Any changes to the TPM should result in all grid users, including generators, paying a fair share of the transmission grid instead of concentrating the costs of the grid onto end-users. It is inequitable to have customers paying 93% of transmission charges and leaving remote generators to extract excess producer surplus through not paying the cost of getting their product to market.

This position is also reinforced by the Panel's focus on energy hardship and affordability for all customers, in all regions. There can simply be no fairness to energy consumers that would fund a significant welfare transfer away from consumers in favour of producers (generators and Tiwai). The opposition the EA has encountered to its TPM proposals reflects active consumer opposition across so many regions of the country.

The timing of the continued TPM review also makes little sense. Leaving aside whether the rationale for reform can be justified, the time to make changes would have been before Transpower's recent large capital investment programme took place – rather than afterwards, with retrospective allocation of the costs incurred.

RECOMMENDATION #6

While we recognise the Panel's reluctance to arbitrate controversial and long-running TPM reform, the Panel has a unique opportunity to highlight to Government the globally unique plan to redistribute historic sunk costs while at the same time highlighting the unfairness inherent in any welfare transfer away from consumers in favour of a few producers. We strongly support introducing a Government Policy Statement to provide guidance on transmission pricing reform. Going forward, the lead responsibility for both transmission and distribution pricing issues should be moved to the Commerce Commission.

DISTRIBUTION

There is an increasing onus on EDBs to not over invest in 40-year life assets while technology, disruption and uncertainty is occurring at pace. Physical networks for delivery of electricity not only need to be cost effective but also ready for new additions consumers will wish to connect such as EVs, PV and battery technology.

The options for EDBs to ensure existing physical network assets are optimised continue to grow, particularly around high-powered data-analytics and integration of new dynamically controlled smart devices. Similarly, consumers will want to be confident that their networks are investing in cost-effective alternatives to new network build, such as efficiency initiatives and investments such as LED lighting, where it is cost effective to do so.

Electricity networks have also traditionally planned with an "n-1" deterministic planning philosophy based on predicted 40-year load forecasts. However, a combination of technology and new business learning such as understanding customer behaviour and tends through smart meter data, active network management, controllable devices and demand control, grid storage, uncertainty of long-term forecasts – all point to such traditional planning processes needing to be modernised. In light of disruption, network planning philosophies will need to be refocussed to avoid overspend on sunk long-life assets with long-term embedded cost implications for consumers.

Vector considers that in contrast to an n-1 philosophy, "incremental probabilistic" planning which utilises smart meter data and other emerging technologies is the asset management alternative that offers the potential to save New Zealand consumers hundreds of millions of dollars in deferred or avoided network capex.

Australian consumers in New South Wales and Queensland are currently experiencing the consequence of network overbuild based on n-1 (or even n-2) network planning philosophies with calls now for the State Governments (i.e. taxpayers) to bear the cost of writing these assets down.

Vector, which modernised its asset management philosophy over a decade ago (and already having saved Auckland consumers hundreds of millions of dollars in avoided capital expenditure), is happy to lead an industry-wide conversation to promote this change in approach to network planning and assist with an industry-wide transition to modernise network planning processes and avoid wasted capital expenditure.

RECOMMENDATION #7

Promote EDBs and Transpower to review their asset planning philosophies with a view to moving away from historic traditional "n-1 deterministic" planning techniques. An n-1 network planning philosophy increasingly risks over investment in physical network assets. A proactive move to modernise asset management planning for investment through adoption of changing technology and better understanding of customer energy behaviour, offers potential to save consumers through avoided real capital expenditure. It also minimises the prospect that physical asset investment, which may not ultimately be required, unnecessarily burdens future generations of consumers.

Vector

CHANGING AND EMERGING NEW ROLES OF EDBs

The rise of the prosumer, multi directional supply and smarter, more connected and intelligent/aware energy platforms all mean that the role of the EDB is being progressively added to. Some EDBs are responding to such change by adopting new roles that complement the shift by customers, new technologies and new business models.

Of course the community still expects EDBs to perform their traditional role of limiting the instances of power outages. However, there is a growing expectation that EDBs must be trusted to perform active network management roles such as voltage and frequency stability, facilitating trading of energy over the "network as a platform" and coordinating the growth in distributed energy resources (DER) to manage peak demand constraints which have traditionally be addressed through physical network solutions.

There will be an increasing need for the regulatory tools to recognise this change or otherwise risk regulation performing to past and not today's customers' expectations. There are a range of regulatory tools that can be adopted to recognise the new and expanding roles EDBs, including more explicit incentives for innovation for EDBs to invest in the capability to support their new roles.

CONSOLIDATION AND COLLABORATION

The Panel continues to raise the issue of the number of lines companies in New Zealand. Several recent studies and expert opinions question the true scale of efficiencies to be achieved through wide-scale EDB consolidation.

Vector does not assume that smaller EDBs lack the capability to absorb new technology and innovation across the network. For example, Vector is working closely with neighbouring EDB Counties Power that has repeatedly demonstrated a range of innovations and customer-focussed technology projects.

Unlike "poles and wires", many new technologies, particularly at a control layer such as the Internet of Energy, systems are fully scalable and may not need to be replicated by individual EDBs. Vector is already collaborating with many EDBs on opportunities to work together at a network control level.

RETAIL

The Panel's report revealed several significant problems with the way in which the retail market is currently functioning, including the five incumbent vertically-integrated retailers continuing to account for more than 90 per cent of the market.

To promote greater competition Vector encourages the Panel to recommend greater transparency through operational separation of gentailers as well as establish a new obligation for gentailers to sell their hedges and other financial risk products through the market so that all retailers can access these products and liquidity.

However, we also propose lifting the remaining restrictions on EDBs' participation in the retail market. This would introduce a new source of competitive constraint via the threat of entry on incumbent retailers.

This is a bold move and recognises the reality that community ownership is valued by customers and is a growing trend globally. The arguments that are typically levelled against EDBs' participation in the retail sector are far less consequential in the current context. Broadly speaking, the historical objections have been the following:

- because EDBs control the infrastructure needed to provide retail services, they would have the ability to restrict or impede network access to gain an unfair advantage;
- EDBs would have the incentive to fund unregulated retail activities from regulated revenue streams, i.e., to engage in cross-subsidisation strategies; and
- EDBs may have useful information not available to the wider market, which might give it an undue advantage in competitive activities.

Many jurisdictions allow EDBs to engage in retail activities. For example, in most US states, EDBs also provide retail functions. Furthermore – and more importantly – those arguments are raised primarily when a jurisdiction is first considering introducing retail competition in a sector that is vertically integrated. In such circumstances, it is quite plausible that a new 'standalone' retailer might struggle to compete with a vertically integrated incumbent 'EDB/retailer' for the reasons listed above. However, that is not the scenario that applies in New Zealand. Today EDBs would not be the dominant retail providers competing against new entrants. Rather, they would be the new entrants, striving to compete against incumbent retailers who continue to command more than 90 per cent of the market.

Allowing EDBs to compete in retail markets would result immediately in 29 new potential rivals to those incumbents. For example:

- all those businesses would have at least some brand recognition with customers, e.g., in their own network footprints most 'in-person' customer encounters are with employees of the EDB (e.g., technicians, etc.), not the retailer;
- EDBs could avail themselves of economies of scale and scope across their regulated and unregulated networks to offset some of the retail customer acquisition and retention costs they would inevitably have to incur.
- EDB retailing could be conducted via a separate entity. Issues of cost allocation would be informed by nearly 20 years of regulation – making the cost structures of EDBs transparent and alleviating the historic fear of cross-subsidies; and
- as has occurred historically, the potential for EDBs to club together and use energy brokers to participate in the energy market could provide an easily scalable and effective model.

If EDBs can provide retail services at a lower cost, then this may serve to arrest the higher cost trend in retailers observed by the Panel and help to deliver lower prices to customers – including those facing affordability problems.

RECOMMENDATION #8

Lift the remaining restrictions on EDB participation in the retail market, resulting immediately in 29 new potential rivals to incumbent retailers

TECHNOLOGY & REGULATION

TECHNOLOGY HAS AN EVER-INCREASING POWERFUL ROLE TO PLAY IN NZ'S ELECTRICITY FUTURE

As an enabler, new technology will unlock for consumers greater choice, increased resilience, lower costs, and a reduction in carbon.

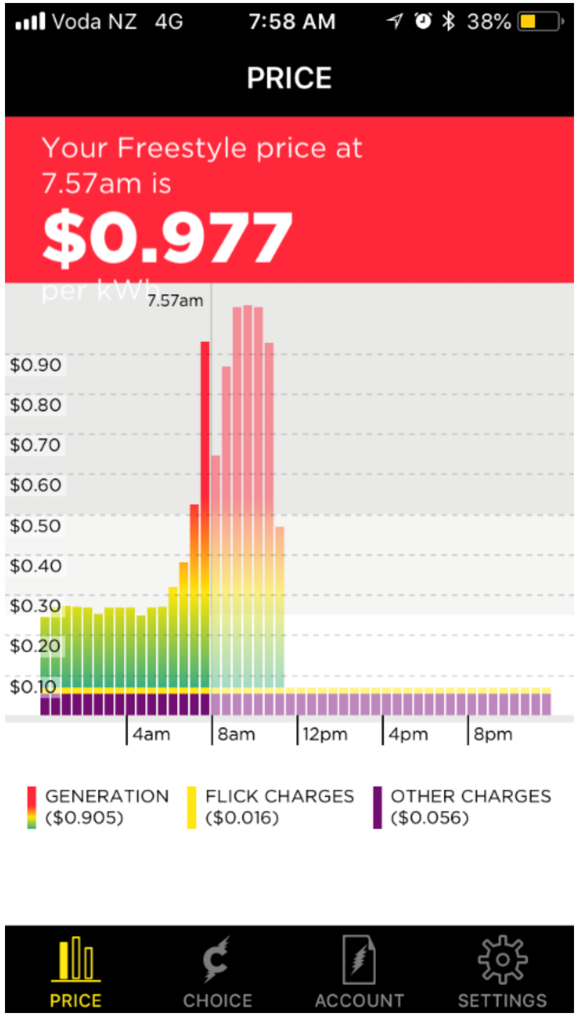
Regardless of what some in the industry may say or believe, industry disruption will march on and all in the sector have a responsibility to stay ahead of the technology curve, embrace change and meet the needs of customers, tomorrow as well as today.

For the capital-intensive parts of the electricity supply chain, technology (typically with declining cost curves) is unlocking more efficient and more flexible options beyond traditional 40+ year capital expenditure. Where industry can deliver service more efficiently through embracing new technology, this equates to savings for customers - today and tomorrow.

For example, to accommodate significant Auckland growth, smart network controls, home energy management systems, demand management and energy storage have all been trialed and proven to offer valuable options to enable Vector to meet and respond to city and population growth.

For the electricity network operators, this customer interest is reinforced by the statutory purpose statement of Part 4 of the Commerce Act, to promote the long-term interests of end-users. For example, new technology assets such as storage, that EDBs may seek to invest in could not only avoid the need for expensive builds but may be able to be used by customers to lower their retail costs. Assets used in one element of a customer bill (distribution) capable of lowering costs in other components of a customer's energy bill, is clearly in the long-term interests of consumers.

We need only to look at energy prices this month in New Zealand to appreciate what increased storage and distributed generation can offer consumers by way of cost savings. The image below is the Sunday morning price of grid-connected electricity (14 October 2018):



While new technologies serve to mitigate network congestion peaks, many such as storage and controllable load/devices have the added advantage of creating broader capability such as "virtual power plants" where capacity is achieved though demand curtailment largely invisible to customers, rather than increased generation.

The Internet of Energy is fast becoming a reality with demand response able to serve network *and* generation peaks without new generation or network build. Even better, as consumer and third-party owned storage and technologies grow, aggregation will offer a new source of competitive market constraint on generation and the exercise of market power.

A further, yet critically important, benefit distributed generation and storage can bring to communities is resilience. While this is only now starting to be recognised and understood, it reinforces the multiple values consumers and communities will increasingly attribute to locally-owned and operated technologies in their communities.

RECOMMENDATION #9

New Zealand regulatory and policy settings need to promote and encourage EDBs to fully utilise and explore emerging non-network technologies – especially when they can form lower-cost alternatives to traditional network-based investments and enable complementary sources of increased resilience and competitive constraint. Enabling smart networks to embrace, demonstrate and leverage the host of technology options emerging offers credible and cost effective means to defer or avoid large scale network investments. Critical to embracing new technology is endorsing that which is uncontroversial overseas - network companies harnessing smart metering data to better understand consumer energy patterns and deliver consumer value through further optimising network management and planning.

ACCESS TO DISTRIBUTION NETWORKS

We disagree with the allegations regarding the potential for EDBs to cross-subsidise competitive activities via their monopoly network businesses.

The Commission is alert to and actively monitoring this issue, and to date has taken the pragmatic approach that investments in new technology can generally be undertaken within the regulated business where they serve to deliver the lines service. Furthermore, the Commission in April 2018 substantially strengthened its related-party transaction rules related to regulated vs unregulated activities.

New technologies such as batteries and distributed generation are increasingly blurring the boundaries between the 'monopoly' and 'competitive' segments of the industry. This trend will accelerate in future. It is therefore essential to maintain a flexible and pragmatic regulatory approach to distributors' investment in new technology, to avoid creating unnecessary barriers and slowing down the pace of innovation.

As has also been seen overseas, there can be significant unintended consequences of EDB exclusion or limitation in new technology, with reduced R&D spending requiring government subsidies, as has been the case with electric vehicle infrastructure in California, and battery roll out in Australia.

In the case of a small economy such as New Zealand, constraining a viable party with both the will and technical expertise from delivering innovation will have a highly detrimental impact on consumers.

EDB PARTICIPATION IN DG AND STORAGE COULD PROVIDE A CREDIBLE, MUCH NEEDED COMPETITIVE CONSTRAINT ON GENERATOR MARKET POWER

Given the incentives in the market, there is an increasing case for EDBs (the majority of which are community-owned) to play an active role in owning and/or coordinating the output from distributed generation and storage.

The concerns the Panel expressed regarding the exercise of market power in the generation market reinforces this position.

In addition to reducing stress on network infrastructure during peak times when capacity constraints emerge, distributed generation and storage can be used to lower wholesale market costs. Driven by the need to manage spikes in demand, networks have the incentive to increasingly turn to storage as an effective means to "flatten the peak" and avoid expensive additional capital expenditure on traditional infrastructure, enabling cost savings to be passed onto consumers.

The reality is there is little to no incentive for other parts of the sector to focus on "flattening the peak".

While Vector is not yet aware of EDBs currently using grid level storage to constrain peak pricing in the generation market it is occurring in other markets. Furthermore, such an activity could be transparently and openly accounted for under existing regulatory settings.

As an elegant example of a win-win-win scenario, beyond the network and competition benefits, distributed generation and storage will also have environmental benefits, helping to reduce carbon emission (for example, where carbon-zero distributed generation displaces carbon emitting generation - geothermal, gas, coal and diesel – all of which are being used in New Zealand's Spring 2018 electricity generation).

The potential wholesale market, environmental and network benefits of distributed generation highlighted above are highly dependent upon where storage and distributed generation is located, the type of plant, when energy is exported and its reliability. The prospect of securing and delivering each of these benefits to consumers – and avoiding the incurrence of unnecessary costs – can be enhanced substantially through the involvement and the utilisation of balance sheets, for example, of community-based EDBs.

Nor would the involvement of EDBs in such activities preclude other potential suppliers from competing. Distribution networks are already 'open access' platforms:

- anyone can connect solar technology;
- anyone can connect a battery;
- anyone can start peer to peer electricity trading; and
- anyone can start a digital platform aggregating demand.

In our view, we have a responsibility to consumers to ensure our network becomes an intelligent energy platform and eco-system that enables new technologies, new innovations, and new retail competition to flourish. This will enable consumers to become prosumers and, in doing so, promote competition and lower costs for consumers.

RECOMMENDATION #10

Endorse the value in locally owned EDBs investing in storage and distributed generation and smart network technologies to address network constraints, whilst recognising the competitive and environmental benefits such investment can increasingly deliver. The Panel's concerns over the generation market underscore the value in such investment ultimately being able to exercise a competitive constraint and counter-balance on market power exercised in the generation market to the benefit of consumers. Existing and recently reviewed cost-allocation rules already accommodate the implications of service that have both a regulated and non-regulated component.

EDBS THE KEY EV ENABLERS

EVs are a significant opportunity to reduce New Zealand's carbon footprint and lower customer bills by better transitioning to electrification. In addition to having significantly lower emissions, EVs can help integrate intermittent renewable generation through intermittent charging and reverse vehicle to grid flows. However, as with other types of DER, if EV adoption and use is not properly integrated into the existing network, EV charging could significantly increase future system costs for consumers.

The impact of EV uptake on the network, and hence the need for network reinforcement, is likely to depend on how the network is operated. For example, the way in which network services are offered may influence EV charging during the network's system peak and where they are charged. Controlled charging could act as a form of demand response thereby avoiding some of the network reinforcement that would otherwise be required.

Underprepared networks for EV growth may present a hurdle to ensure the connection and augmentation needs presented by EVs can be smoothly accommodated by networks. Flexibility and support in the regulatory design should be enabled to ensure networks are supportive of the opportunities EV take up present

RECOMMENDATION #11

Electric vehicle uptake offers one of the most significant carbon reducing opportunities for NZ. EVs will also build local resilience and empower customers with significant storable energy that will facilitate broader customer-centric innovations such as P2P trading. Locally owned/controlled networks are already charged with ensuring their communities and customers have choice about where, when and how fast they can charge their EVs. Policy settings supportive of the mass up-take of EVs and high-volume capacity charges needs to acknowledge the enabling role of EDBs, including through sensible adoption of smart dynamically operated EV chargers in the home or workplace. Where increasingly higher capacity EV charges can be synchronised with any pre-existing network capacity constraints, the need for significant network investment upgrades (and increased costs to customers) can be avoided.

REGULATORY CLARITY AND CONSISTENCY LACKING

It is interesting to note how much of the EA's work programme is dedicated to addressing EDB issues- in the context of a regulatory framework where the Commerce Commission supposedly retains comprehensive regulatory responsibility over EDBs.

The increasing focus of the EA on EDBs in parallel to the Commerce Commission comes at the expense of resource and attention on those layers of the supply chain (wholesale generation and retail) assumed by policy makers to be the primary focus of the EA. We encourage the Panel to review for themselves the work programme of the EA (and indeed the EA's submissions to the Panel) to understand the present balance of the EA's focus.

Where this focus is becoming increasingly challenging is in the adoption of technology in the electricity sector. There is increasing uncertainty

ELECTRICITY AUTHORITY	COMMERCE COMMISSION
The EA is currently undertaking a study into the efficiencies of EDBs.	The Commerce Commission has the express statutory mandate to improve EDB efficiency and for EDBs to act in the long-term interest of consumers.
The EA has recently commenced a study into the strategic implications of emerging technologies for EDBs and how they might adapt in response to the changes.	The Commerce Commission has also just undertaken a section 53ZD request relating to the use of emerging technologies of all EDBs and published information summaries on its website.
The EA proposes to define comprehensive service quality terms via its proposed Default Distribution Agreement despite their empowering Act expressly prohibiting the EA via Code amendments to "purport to do or regulate anything that the Commerce Commission is authorised or required to do or regulate".	The Commerce Commission administer a price/quality regime for regulated EDBs. The issue is presently before the Court of Appeal relating to a declaratory judgement of clarification that Vector has sought.

Beyond the area of new technology, we have also seen the EA openly criticise the Commerce Commission's decision to move to revenue-cap based regulation. In such a fundamental aspect of the regulatory regime it was highly unusual to see two regulators take such diametrically opposed positions and, in doing so, undermine the certainty that is sought through the Commerce Commission's Part 4 regulation.

It is increasingly obvious to Vector that the Commerce Commission, both as the specialist competition body as well as regulatory body overseeing EDB regulation, needs to have remit for the oversight of EDB's and new technology. Work programmes must be clearly defined and sitting with one responsible body.

Similarly, given the inherent nature of a price/quality regime, it is only the Commerce Commission that can comprehensively administer a regime where price and quality are inherent trade-offs.

RECOMMENDATION #12

To avoid both the EA and Commerce Commission looking at the same issues in parallel (and contradicting each other on fundamental issues of quality regulation and new technology), clarify that the Commerce Commission has responsibility for price and quality regulation of EDBs as well as regulatory oversight for the adoption of new technology as part of existing Part 4 regulation and statutory objectives around innovation and efficiencies.

ACCESS TO SMART METERING DATA

As highlighted in the Report, obtaining the benefits of emerging disruption in the electricity market will depend largely on access to consumer and consumption data.

The greater understanding all industry participants have about customer energy usage, the more innovation will be enabled to meet the long-term needs of customers. For example, granular data access by EDBs will support technology change, up-to-date outage information, network management/planning and support networks to build efficient, lower cost smart networks. Without granular data, EDBs are forced to make assumptions about household trends critical to broader network peak calculations.

Access to meter data is also an enabler for new services that can promote competition and greater consumer participation in the market. For example, smart meter data can enable energy trading, smart home energy management, electric vehicle charge scheduling, demand response participation, and electricity brokerage and generation and battery aggregation.

The EA has proposed work on Multiple Trader Relationships and the technology and smart metering is in place to enable this and potentially offer customers and new entrants new options.

EDBs will need to increasingly leverage data to proactively improve grid planning and operations. Vector has evidenced that EDB's can use data analytics to lower the overall cost of the network. Vector is happy to share the network planning and management value that can be achieved with smart metering data along with its information protocol to encourage best practice for data use and security.

It is positive to note that data and data exchange is a central work programme for the EA, which Vector will continue to engage with and drive for change.

There are significantly less complex and costly methods of data exchange than a central repository, as identified by the Panel. We encourage the panel to endorse an approach that relies upon commercially agreed terms, which has always been a strong feature of the smart metering market. For example, where EDBs do not currently have rights to data then these can be negotiated and implemented through commercial arrangements.

RECOMMENDATION #13

Access to data will be a key enabler to disruption, both from existing players in the market but also international potential entrants and business models (such as when the Netflix of energy arrives). The EA's proposals around Multiple Trader Relationships will enable multiple parties, including EDBs, to simultaneously access smart metering data and is another initiative that offers potential to benefit customers.

PRICING INNOVATION

Lines charges should be simple and designed to align with what customers experience nowadays in other services. Overly complex pricing to deliver text-book cost-reflective pricing risks adding significant complexity and uncertainty to consumers' bills and their overall understanding of energy costs. The Panel is also right to observe that any pricing reform involves winners and losers. Our research to-date reveals that vulnerable customers are overly represented in seeing price increases following the introduction of cost-reflective pricing.

It is also vital that pricing mechanisms do not penalise technology or have a technology bias.

Vector firmly believes in rewarding rather than penalising consumers and has advocated for pricing innovations such as Peak Time Rebates. Vector are happy to share further details on this pricing mechanism with the review panel, which has been highly regarded internationally.

SECURITY OF SUPPLY

New Zealand cannot be complacent about its electricity security of supply.

Technology, regional independence and shared capacity must be recognised as enablers for achieving a resilient electricity system. Whilst security of supply has always been a focus for the industry, it is only very recently that policy attention has shifted to the resilience of the energy system.

Recent events both locally and internationally reinforce the need for more innovative thinking around the principles of resilience. For example, severe storms, anticipated to increase with global warming, has seen a radical departure in electricity network design in many countries to incorporate innovations such as microgrids.

REGULATORY OBJECTIVES

While Vector acknowledges the issues in the Report on the inclusion of environmental and fairness concerns in the regulatory framework, Vector believes that as electricity has a disproportionate influence over the environment, carbon considerations should be included in the regulatory framework for electricity, as is the case internationally.

Vector is not prescribing how carbon should be reviewed by energy regulators, simply that carbon versus carbon-free electricity generation (as distinct from simply renewable/non-renewable generation) should be an express consideration in the decision-making process.

Resilience considerations are also missing from the regulatory framework. The current framework is focused on reliability (security of supply) rather than resilience, based on historical benchmarks. This does not recognise the exponential changes that are occurring due to new technology and climate change.

LOW FIXED USER CHARGE

It is widely acknowledged that the Low Fixed Charge Tariff has unintended consequences and is not delivering for low-income consumers.

It is critical that retailers ensure consumers are on the optimal pricing plan. This is a matter the Panel should oblige of retailers. Vector is aware of sustained periods where retailers, despite having the obligation to do so, have not placed consumers on the correct network pricing plan (i.e. on the low fixed user charge where consumers ought to be, or vice versa).

THANK YOU

Vector®

ELECTRICITY PRICE REVIEW

SUBMISSION FORM

How to have your say

We are seeking submissions from the public and industry on our first report into the state of the electricity sector. The report contains a series of questions, which are listed in this form in the order in which they appear. You are free to answer some or all of them.

Where possible, please include evidence (such as facts, figures or relevant examples) to support your views. Please be sure to focus on the question asked and keep each answer short. There are also boxes for you to summarise your key points on Parts three, four and five of the report – we will use these when publishing a summary of responses. There are also boxes to briefly set out potential solutions to issues and concerns raised in the report, and one box at the end for you to include additional information not covered by the other questions.

We would prefer if you completed this form electronically. (The answer boxes will expand as you write.) You can print the form and write your responses. (In that case, expand the boxes before printing. If you still run out of room, continue your responses on an attached piece of paper, but be sure to label it so we know which question it relates to.)

We may contact you if we need to clarify any aspect of your submission.

Email your submission to energymarkets@mbie.govt.nz or post it to:

Electricity Price Review

Secretariat, Ministry of Business, Innovation and Employment

15 Stout Street

PO Box 1473

Wellington 6140

Contact details

Name	**Mark Toner**
Organisation	**Vector**
Email address or physical address	**101 Carlton Gore Road, Newmarket, Auckland**

Use of information

We will use your feedback to help us prepare a report to the Government. This second report will recommend improvements to the structure and conduct of the sector, including to the regulatory framework.

We will publish all submissions in PDF form on the website of the Ministry of Business, Innovation and Employment (MBIE), except any material you identify as confidential or that we consider may be defamatory. By making a submission, we consider you have agreed to publication of your submission unless you clearly specify otherwise.

Release of information

Please indicate on the front of your submission whether it contains confidential information and mark the text accordingly. If your submission includes confidential information, please send us a separate public version of the submission.

Please be aware that all information in submissions is subject to the Official Information Act 1982. If we receive an official information request to release confidential parts of a submission, we will contact the submitter when responding to the request.

Private information

The Privacy Act 1993 establishes certain principles regarding the collection, use and disclosure of information about individuals by various agencies, including MBIE. Any personal information in your submission will be used solely to help develop policy advice for this review. Please clearly indicate in your submission whether you want your name to be excluded from any summary of submissions we may publish.

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Summary of questions

Part three: Consumers and prices

Consumer interests

1 *What are your views on the assessment of consumers' priorities?*
We agree that consumers want a reliable supply of electricity at fair and affordable prices. However, customers increasingly want more than this – they expect their services to be faster, cheaper, and more connected than ever before. Consumers are also becoming more environmentally and socially conscious and have an increasing expectation that their businesses and institutions will reflect these priorities. Technology is enabling consumers to have greater control over many aspects of their lives, and the energy sector is no exception. Under this new 'customer-centric' model, consumers will be able to choose how and from whom their lives are powered. There are also growing opportunities for consumers to power their own lives through technologies such as solar and battery solutions. Our majority consumer ownership aligns our priorities with those of our consumers. We have pledged to become carbon neutral by 2030 and are part of the climate leader's coalition, reflecting the environmental consciousness of our consumers. We are embracing new technology - trialing peer-to-peer trading, as well as vehicle to home charging infrastructure, and solar PV, to enable consumer control. We are also trialing energy management solutions in low-decile and rural areas on our network, to target potentially vulnerable consumers on our network. We are working hard to engage with our consumers' to continually evolve with their changing needs. While customer engagement is complex, this engagement is part of our core value set and will ensure that we continue to reflect the priorities of Auckland consumers.

2 *What are your views on whether consumers have an effective voice in the electricity sector?*

It is widely acknowledged that the electricity industry is complex. This complexity creates accessibility issues for consumers seeking to understand and engage in the electricity market. Disengaged consumers are unlikely to have an effective voice in the electricity sector. Bill and tariff transparency are an important first step, allowing consumers to compare providers, understand their electricity costs, and change their energy usage/supplier accordingly.

While there are several organisations available to provide information and support to consumers to navigate the sector, many people do not have the time or understanding to engage with them. Industry participants need to increase their direct engagement with consumers to create further transparency, for example through a consumer champion. Consumer champions can operate as the business 'conscience' to evaluate the depth, breadth and quality of a company's engagement and assess how well the outputs from this have been interpreted in their business planning.

Due to the regulated transparency, regional focus, and consumer trust ownership of the majority of distribution businesses, EDB's interests are directly aligned and connected to their consumers, enabling a strong consumer voice. This year, the ENA also established a standing Consumer Reference Panel, and its inaugural meeting provided valuable input into the measures of quality of service that consumers value.

Vector undertakes regular engagement with Auckland consumers to better understand their needs, including a regular tracking study of almost 3000 customers. We have also developed a Customer Advisory Board, which has 12 members of diverse backgrounds and provides us with valuable insights as to; the satisfaction climate of our customers, customer preferences and trends, as well as valuable service and process improvement suggestions. Our majority owner Entrust also works hard to engage Auckland communities, for example the hip-hop video Entrust created to explain the Transmission Pricing Methodology review, which achieved significant reach on social media.

We agree that greater collaboration can and should occur between retailers and EDBs to support consumer interests. With our advanced analytics capability, we are happy to lead this conversation, and encourage deeper customer engagement and analysis of customer demands and priorities.

While there is a need for industry to enable a strong consumer voice, the public sector can also play a key role in consumer engagement. One of the themes to emerge from the Australian Energy Market Commission's recent retail market review is that customers are more likely to trust information supplied by governments or regulatory agencies. ConsumerNZ and EECA could be supported to extend their role, engaging directly with those in energy hardship to provide tariff and bill information support, and provide education on energy efficiency to reduce their bill. Additional investment could also be made in making public price comparison websites as simple and as accurate as possible and available in multiple languages.

Finally, it is increasingly obvious that new technology can give consumers' control over their energy use and how they power their lives. Technology must therefore be embraced to enable consumer preferences and engagement in the sector. Actively creating transparency, educating consumers, and embracing customer-centric technology solutions that can understand consumer preferences and implement them, will be central to enabling a stronger consumer voice.

3 *What are your views on whether consumers trust the electricity sector to look after their interests?*

It is increasingly obvious that trust is low globally across many institutions and businesses. Trust is hard to gauge in the electricity sector as there appears to be significant apathy from consumers due to the lack of transparency and high levels of disengagement. It is positive to note that trust in the energy sector in New Zealand appears higher than for our counterparts in Australia, however there is considerable room for improvement.

Transparency is a key factor in developing trust. However, in the case of vulnerable consumers, transparency alone is not enough, industry must step up to provide engaged transparency. If consumers are time poor, struggling to make ends meet, or vulnerable through other means (education, health etc.), a well-informed website or app is unlikely to have the necessary reach.

Unfortunately, the needs of consumers are at odds with the large vertically integrated generator/retailers, which make money off peak demand, generation shortages, high electricity prices and have created a two-tier market with perverse incentives such as 'late payment penalties' which serve to further undermine the trust of vulnerable consumers. EDBs however, are incentivised to cap the peaks, have regulated earnings, regulated transparency and in many cases, provide significant returns directly into the hands of the consumers. Trust is far easier to garner when incentives are aligned.

Prices

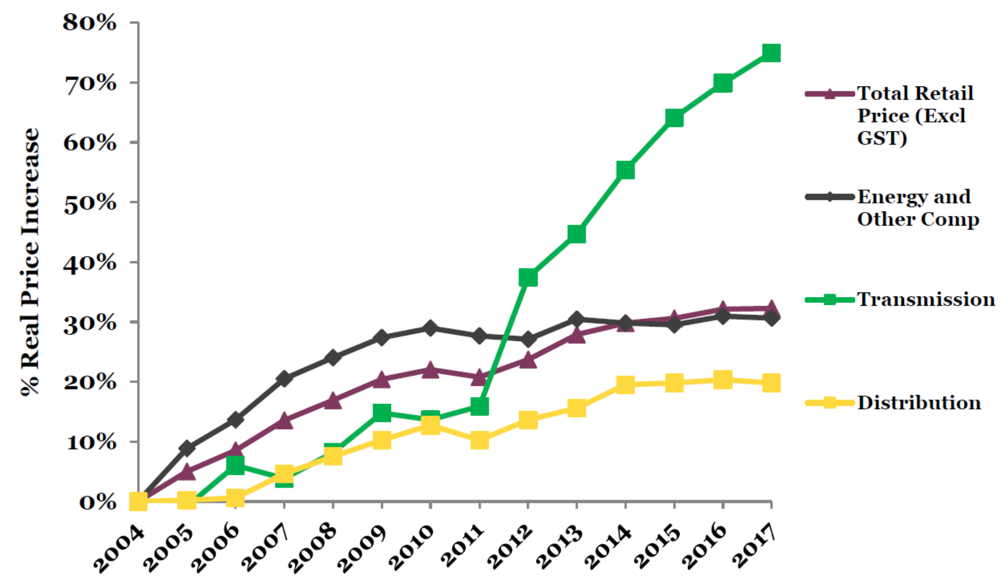
4 *What are your views on the assessment of the make-up of recent price changes?*

We have some concerns regarding the Panel's assessment of recent price changes. The electricity industry experienced significant change during the 1990s, which makes comparisons during (and prior to) that period difficult. The challenge of obtaining accurate data is evident in the Panel's reliance on a Trustpower presentation, which itself is missing data from 1990 to 1999.

Given these issues, we question whether the Panel's estimate that distribution charges to householders increased by 548 per cent from 1990 to 2018 is accurate. We accept that there has been a re-allocation of costs from business to residential customers, but this reflects the unwinding of previous cross-subsidies and the fact that residential customers make a larger contribution to peak demand. Further discussion of the cost allocation issue can be found under Q16 below.

The Panel would be better to focus its analysis from 2000 onwards (when information disclosure requirements were first introduced on lines companies). PwC has undertaken analysis of the change in residential bill components from 2004 to 2017 on behalf of the ENA. This analysis shows that distributor charges have increased by an average of 1.4 per cent per year in real terms, which is the lowest rate of increase of the five components of the bill.

Figure 3: Real price increase by component of total delivered electricity charges (excl. GST) for a domestic consumer using 8,000kWh (%) 2004 - 2017



The Panel should also take into account the payment of dividends to consumers by trust-owned EDBs. In 2018, our majority shareholder Entrust paid a dividend of $350 to 331,000 households and businesses in the Entrust district, which comprises Auckland, Manukau, northern Papakura and eastern Franklin. This equates to two months free electricity each year for the average Aucklander.

Looking at the distribution sector more broadly, PwC analysis for the ENA (based on public disclosures) shows that on average EDBs distributed between $185 to $215 per ICP over the 2015-2017 period. This equates to approximately 1.20c/kWh-1.30c/kWh off the bill.

The Panel is however correct to highlight concerns with retailing related costs, which appear to have risen substantially – contrary to what would be expected in a competitive market. Moreover, while the Panel found that wholesale contract prices have been roughly stable since 2004, this does not mean that the *level* of wholesale prices is reasonable. As discussed further in the Industry section, there are long-running concerns regarding exploitation of market power in the wholesale market which remain unresolved and are imposing large costs on consumers.

5	*What are your views on the assessment of how electricity prices compare internationally?*

It is difficult to draw firm conclusions from international comparisons of electricity prices, as there are likely to be substantial differences between the costs to supply electricity across different markets. For example, New Zealand has a plentiful supply of relatively cheap hydro generation, whereas other countries in the sample do not. On the other hand, New Zealand has a low population density which increases the unit costs of electricity transmission and distribution. Confusing matters further in Figure 9 is the fact that the 'electricity' component of the residential prices is included alongside 'tax'. It is unclear why the electricity component was not isolated and plotted alone. As the Panel notes, the tax component of prices in New Zealand is among the lowest in the OECD, hence if this were removed our ranking against other countries would be considerably worse. In addition, New Zealand's ranking appears to be deteriorating over time.[1]

The key issue for assessing the performance of the sector is how prices compare to costs, i.e. the margins that firms are earning throughout the supply chain. Further comments on the Panel's assessment of margins in different segments of the industry are set out in our response to the Industry section.

6	*What are your views on the outlook for electricity prices?*

We agree with the Panel that increased electricity demand from the transition to electrified transport and heat will not necessarily lead to price increases, given the significant potential of emerging technologies to deliver electricity more efficiently and affordably. It is vital however, that this new technology is effectively managed to harness these benefits and manage the potential for new load to appear on electricity networks, to ensure resilience and reduce the risk of rising network costs.

In addition, there is significant scope for reducing prices through greater competition in the wholesale and retail markets. This is discussed further in our comments on the Industry section below.

Affordability

7	*What are your views on the assessment of the size of the affordability problem?*

[1] See https://figure.nz/table/8SxWptOzsc5oWqRp/download-source-dataset

We agree with the Panel's assessment that energy affordability is a significant problem, particularly for vulnerable customers such as those on low incomes and beneficiaries. While energy affordability needs to be seen in a wider social context of poverty and disadvantage, there is clearly an important role for the electricity industry to play in addressing the issue. We believe an integral part of supporting energy affordability will be increasing energy efficiency and supporting energy efficiency initiatives. This is discussed further in our response to the Q30.

8 *What are your views of the assessment of the causes of the affordability problem?*

The Panel is correct to point to issues such as the gap between the cheapest and most expensive retail tariffs, and the difficulties faced by low-income customers in engaging with the market, and the impact of lost 'prompt payment discounts' (which are effectively late payment penalties in disguise) as important drivers of higher prices and hence affordability. To this list we would also add exploitation of market power in the wholesale market and barriers to entry created by the vertically integrated nature of the large generator-retailers. Further discussion of these issues is set out in the Industry section below and in the attached report by Axiom Economics.

Energy bills are a combination of the price and quantity consumed. While the Panel acknowledges the potential gains from improving energy efficiency in Figure 12, overall, we consider that the report has given insufficient attention to these issues. There are an ever-increasing number of ways to deliver permanent energy efficiency gains for households and communities – ranging from education, power-saving LED lightbulbs, hot water load control, home insulation, heat pumps, all the way through to community-based solar. Vector and other EDBs are well-placed to take a lead role in addressing these issues, given the strong incentives we face to cap peak demand and our customer ownership model. The impact of energy efficiency measures is covered in more detail in our response to Question 30.

We recently delivered solar and battery technology to a housing development in Órákei, to demonstrate how a future community energy solution might operate. Perhaps most importantly, the initiative made consumers more aware of their power bills. We saw a shift in personal behaviour as residents realised they could directly influence their bill, leading to a game mentality, with neighbours competing against each other to reduce their monthly power bill, which was driven as low as $13 for some residents.

The impact of energy efficiency measures is covered in more detail in our response to Question 30.

The clear steps to combat affordability issues must be to first implement a process to ensure customers know of, and can move easily to the best tariff, and then remove the late payment penalties. Once these steps are in place, we believe this will deliver savings after which solutions like providing LED lights will be more effective and targeted than seeking to change tariffs or fund winter payments.

9 *What are your views of the assessment of the outlook for the affordability problem?*
We believe the Panel is too pessimistic regarding the outlook for affordability. As discussed under the previous question, the availability and cost of energy efficiency technologies is improving rapidly, along with distributed generation technologies, such as solar, that can reduce demand for grid-connected electricity. The key issue is ensuring that technology is available to all customers, not just those on high incomes. This will also help to mitigate any risk of network cost-shifting onto low income customers.

Summary of feedback on Part three

10. *Please summarise your key points on Part three.*
Disruption will benefit consumers, more than currently appreciated The recommendations of the Panel need to encourage and enable new businesses and new energy technologies to flourish, disrupt, challenge, compete and create fresh customer solutions. Initiatives much broader than the traditional energy model need to be welcomed, embraced and incentivised. Data analytics, smart load control, consumer owned distributed generation, dynamically controlled smart EV charging, and virtual power plants are just some of the terms needing to be embedded into forward looking recommendations and a "smarter with less" ethos. ***Complete customer bill transparency - including all itemised components - overdue*** A key enabler of a more consumer-centric future will be greater transparency in the sector. In particular, it means customers having complete bill clarity and transparency and ease of access to their own historic smart metering data (neither of which are assured today). A host of new opportunities exist once a consumer can more easily share their own data with third parties of their choice and beyond their incumbent retailer including; more competitive and dynamic pricing, energy efficiency analysis, demand aggregation, bundled or integrated service options, load control device options and tailored pricing options. Bill confusion is also a key factor explaining why so many New Zealand customers are not actively participating in the market. Without bill transparency, the likelihood of customers understanding their choices and shopping around for the best deal diminishes. In the energy market, the volume of switching alone - much of which can be attributed to relocations - does not necessarily indicate a healthy market or good outcomes for consumers, particularly in the context of a two-tier retail market. Ensuring the break down and specification of each component of the energy bill will be a big step toward consumers better understanding their costs and the drivers of their bill. The lack of transparency and resulting consumer confusion may also be one of the

reasons why many consumers, particularly vulnerable consumers, have been financially penalised by the common practice “prompt payment discount”.

Transparency will also enhance consumer confidence, for example that a retailer has passed-through any reduction in lines or transmission charges. At present there exists neither the regulatory obligation to do so, nor the transparency to check whether retailers have delivered such benefits through to customers.

Right Sizing Tariffs

Vector welcomes the Panel’s strong focus on energy hardship. The lowest-hanging fruit for addressing energy poverty is ensuring that consumers are on the right tariffs. This applies at both the lines charge level (low fixed user charge or not) as well as consumers being on the optimal retail plan.

We are aware of a significant number of Auckland customers (15%+) who are not placed on the optimal lines charge and therefore could be paying at least $121 per annum more than they should be. Only retailers are permitted to switch consumers between low-fixed user and standard lines charges. Much greater enforcement of this obligation on retailers is overdue and has been repeatedly raised by Vector in communication with retailers.

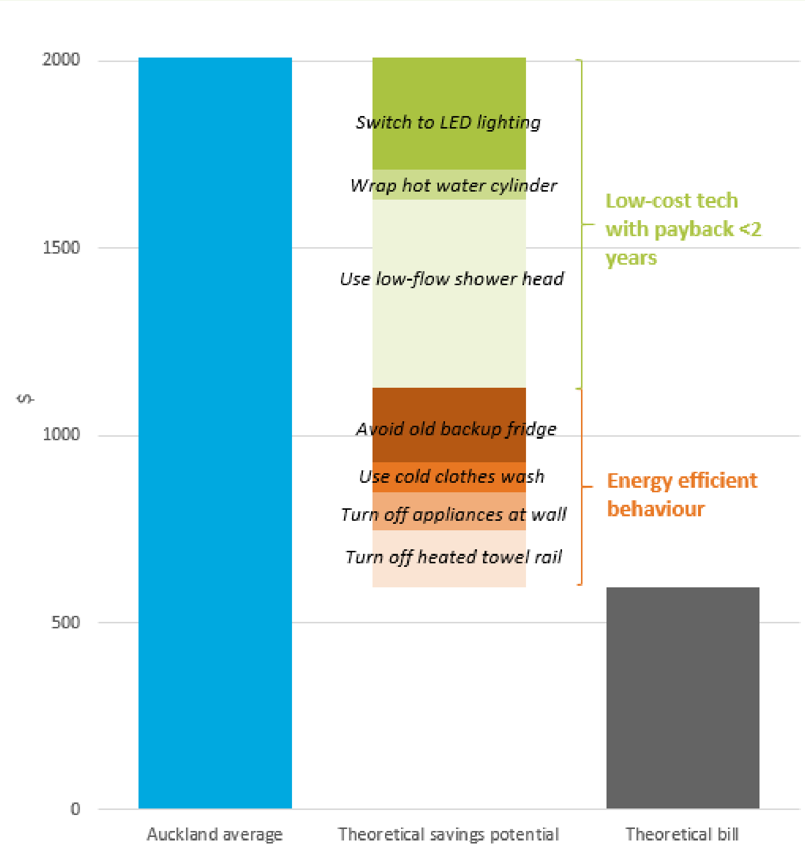
For optimal retail tariff options there would also appear significant scope to provide a greater obligation on retailers to inform consumers about cheaper tariff options and make it easy for consumers to switch so that they are not left on old expensive tariffs. Such an obligation could either be applied to prices across the market, or at least among pricing offered by their existing retailer.

Much has been submitted on the inequity of the so-called “prompt payment discount”. We encourage the Panel to swiftly address the issue which acts as a severe penalty for late payment and which is disproportionate to any costs borne by the retailer.

The importance of energy efficiency to alleviate energy hardship

In addition to examining electricity prices and optimal tariffs for consumers, the Panel will need to also be alert to the volume side of the energy bill equation. Energy efficiency initiatives, be those by industry, government or customers themselves, can deliver meaningful (and permanent) energy cost reduction.

To assist the Panel, we have prepared the following diagram showing the theoretical cost savings from publicly available information (including EECA) particularly around low-cost technology improvements or energy efficient behaviour.



Industry participants and regulators can actively support energy efficiency and reduced electricity bills by; supporting EECA's work programme, encouraging energy literacy in schools, providing energy efficient lightbulbs to vulnerable consumers, and supporting home insulation programmes. We believe EDBs should also be encouraged and enabled to put solar PV and household batteries into their regulated asset base for vulnerable consumers to access renewable energy and better manage their electricity requirements, and incentivise load control technology to flatten peak demand and reduce network costs.

Vector is happy to share analysis with the review panel, which highlights that low-income consumers have significantly higher electricity usage. By way of example, our data analysis across Auckland households reveals the most deprived households have benefited least from the 1% per annum average decline in energy consumption over the last 10 years and the efficiency gap between poorer and wealthier homes is estimated at 7kWh/m2 ($2/m2).

Pono Home is an excellent example of a targeted and proven solution to energy affordability, currently underway in the United States. Pono Home provides free green home audit/upgrades to assess what is causing consumers to spend too much on their utilities bill via a 100-point checklist. This includes an assessment of appliances, electronics, lighting, building envelop, leaks, and much more.

Two-tier retail market

With nearly half of New Zealand consumers not having switched retailers at any point over recent years (and therefore potentially paying hundreds of dollars over and above a competitive market price for their energy), we do not consider this to be a market that is delivering optimally for consumers. As recently found in Australia and the United

Kingdom, New Zealand now clearly has a two-tier electricity retail market which warrants policy intervention.

A two-tier market structure means that new entrants and smaller retailers are vying primarily for the ‘active’ customer segment which, by definition, is likely to be especially price sensitive and may offer only relatively low margins.

Larger incumbent retailers are well-placed to charge (or keep on costly legacy tariffs) those disengaged customers prices that exceed –significantly – the long-run cost of supplying the services, without concern about losing those customers to rivals.

In short, while new entrants may be able to acquire lower-value price-sensitive customers quite quickly by offering cheap deals, attracting the disengaged customers of incumbents is far more difficult which serves to insulate incumbent retailers from genuine competition across all their customer base, and ensures that many consumers miss out on available lower prices. This is a troubling retail practice that has been identified and addressed in other markets such as telecommunications.

Regulatory rules on “saves and win-backs” would appear a last bastion of defense for incumbent retailers. Regulatory inattention to the true competitive impact of such rules must now be called out and credible protections introduced, such as a moratorium period.

Increases in Electricity Prices

We have some concerns regarding the Panel’s assessment of recent price changes. The electricity industry experienced significant change during the 1990s, which makes comparisons during (and prior to) that period difficult. The challenge of obtaining accurate data is evident in the Panel’s reliance on a Trustpower presentation, which itself is missing data from 1990 to 1999. We do not accept Trustpower’s information as the nature of the industry through this period. This was at a time that the industry was very integrated so, at best, it looks like a guess.

The Panel should instead focus its analysis from 2000 onwards (when information disclosure requirements were first introduced on EDBs). PwC analysis of the change in residential bill components from 2002 to 2017 shows that distribution charges have increased by an average of 1.4 per cent per year in real terms, which is the lowest rate of increase of the five components of the bill.

Given the issues with historic data accuracy, we question whether the Panel’s estimate that distribution charges to householders increased by the level the Issues Paper reports. We accept that there has been a re-allocation of costs from business to residential customers, but this reflects the unwinding of previous cross-subsidies and the fact that residential customers make a larger contribution to peak demand. We also note that in Vector’s case our pricing methodology is fully disclosed. Furthermore in 2008, this was endorsed via an administrative settlement with the Commerce Commission and pricing across the wider Auckland region and which resulted in rebalancing lines charges at the request of the Commerce Commission.

Finally, the Panel should also take into account the payment of dividends to consumers by trust-owned EDBs.

Customer Engagement

Actively creating transparency, educating consumers, and embracing consumer-centric technology solutions that can understand consumer preferences and implement them, will be central to enabling a stronger consumer voice.

EDBs have a central role to play in engaging with customers. Not only does this relate to network issues like connections, outages and reliability but also choices customers now have in relation to their energy purchase and usage. Increasingly, as Vector is experiencing in the context of Auckland growth, lines businesses must engage regularly with customers to understand needs and trends to build the least cost, high efficiency network.

With anticipated disruption at a retail level, such as multiple trader relationships, global energy management systems and peer-to-peer trading, EDBs will remain the one common and constant point for customers on these network and related issues. EDBs are embedded in their communities reinforcing their accessibility and natural point of connection in the eyes of consumers.

Solutions to issues and concerns raised in Part three

11. *Please* briefly describe any potential solutions to the issues and concerns raised in Part three.

Recommendation #1: Provide consumers with complete bill transparency of energy bills so that customers can accurately see all components of the bill separately – including itemised energy, transmission, distribution, retail, tariffs, late payment fees and regulatory costs. Furthermore, supplement bill transparency with real and fast access to historical smart metering data for customers and their nominated agents to enable greater consumer choice and place energy cost management back into the hands of consumers.

Recommendation #2: Broaden energy hardship proposals and initiatives beyond simple tariff reform, recognising that energy bills are made up of a combination of price and volume, and that efficiency matters. There are a number of practical ways, ranging from low-cost to high-cost, to deliver permanent energy efficiency gains for households. Propose reforms to (1) ensure retailers are obliged to place consumers on the optimal tariff and prohibit late payment penalties and (2) clarify the ability of EDBs to invest in energy efficiency investments such as LEDs, winter heating control etc. where long-term consumer interests can be demonstrated.

Recommendation #3: Follow the lead of both the UK and Australia in acting on the existence of a two-tier electricity retail market. Innovative policy options, such as those being implemented in the UK and Australia, are needed to assist those who for whatever reason are not actively participating in the market and taking advantage of the best available offers. At a minimum, a much greater onus must rest on retailers to be transparent with their customers about more economical pricing plan alternatives. Saves and win-back rules need to be reformed as they serve as a structural impediment for new entrant retailers to challenge incumbent retailers.

Part four: Industry

Generation

12. *What are your views on the assessment of generation sector performance?*

We do not share the Panel's generally positive assessment of generation sector performance. Evidence suggests that exploitation of market power by the large vertically integrated generators is much more widespread than suggested in the report. Recent modelling analysis by Dr Steve Poletti at the University of Auckland (peer reviewed by Professor Derek Bunn at London Business School) estimated that wholesale market power rents in the period 2010-2016 amounted to $5.4 billion. This equates to over $350 per customer per year.[2]

The analysis of wholesale contract prices versus the long-run marginal cost (LRMC) of building new power stations does not demonstrate convincingly that competition has been effective in restraining prices. The estimated new build costs appear high by comparison with recent international experience with new generation build, including solar and wind.[3,4] This is relevant since the Panel itself notes in its Technical Paper that "looking ahead, wind generation may supplant geothermal plant as the main new source of grid-connected generation".

There are of course differences across countries that will affect the cost of renewable investment, but we think the Panel should look again at its LRMC figures to ensure that they are up to date, given the rapidly declining cost curves for these technologies.

The Panel's LRMC analysis is undertaken only at an aggregate level using one-year baseload contract prices. The picture depicted in Figure 14 could change significantly if the exercise was undertaken on average spot prices (rather than contract prices), which are likely to be affected more acutely by the exercise of short-term pricing power. It would also be of interest to look at how build costs compare with other types of contracts.

New Zealand has a very 'light touch' regime compared to most other jurisdictions with respect to monitoring and mitigating market power. The current "Undesirable Trading Situation" (UTS) provisions in the Electricity Industry Participation Code are only a weak deterrent, and moreover the EA's enforcement of the rules has been ineffective. For example, its investigation of Meridian's trading conduct on 2 June 2016 was discontinued without penalty, despite the EA Board concluding that it clearly breached UTS provisions. Similarly, its investigation of Mercury's behaviour on 8 December 2016 was also discontinued as the parties were unable to reach a settlement agreement.

Further discussion of generation sector performance can be found in the attached paper by Axiom Economics.

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[2] Based on EA figures for total ICPs as at 30/09/2018.

[3] See: https://reneweconomy.com.au/australia-solar-costs-hit-extraordinary-new-lows-50s-mwh-27007/

[4] https://www.iea.org/publications/renewables2017/

13. *What are your views of the assessment of barriers to competition in the generation sector?*

The evidence does not support the report's statement that there are "relatively low barriers to generation competition". As the report notes, the five large gentailers still account for 90% of capacity – a fall of only 8 percentage points since 1990. Furthermore, the report notes on p11 that co-generation in industrial plants accounts for about five per cent of the country's output. It is not clear whether co-gen is included in the market share figures, but if so this suggests that genuine independent generators may account for as little as three per cent of the market. This indicates that despite high wholesale prices and evidence of significant market power rents, independent generators are struggling to enter and compete against the five large players. As mentioned in the paper, a key barrier to entry is likely to be the limited depth and very low liquidity in the hedge contract market. Further comments on the hedge market are set out under Q17 below.

14. *What are your views on whether current arrangements will ensure sufficient new generation to meet demand?*

Future patterns of electricity demand are highly uncertain, given the rapid pace of technological change. If the economy transitions to an electrified transport and heating system, we accept that additional grid-connected generation capacity may be needed. However, at the same time technologies for load control are advancing rapidly, which can help to improve asset utilisation. We also consider that the paper is too pessimistic on the prospects for small scale distributed generation. As the cost of solar and battery technologies continue to fall, there is scope for DG to provide a significant proportion of increased electricity demand.

The spot market currently appears to be rewarding investment in new generation more than adequately, given the presence of significant market power. However, given the dominance of the five large players and the illiquid contract market, we are concerned that any new generation investment that is needed may not be either timely or efficient, and that innovative technologies will struggle to get traction.

Retailing

15. *What are your views on the assessment of retail sector performance?*

To undertake a robust assessment of the performance of the retail market, it is crucial to dig below ‘headline’ indicators such as switching rates and the number of retailers. The report contains some useful material in this regard, but more analysis is needed.

The available evidence strongly suggests that the New Zealand retail market suffers from similar problems to those identified in the UK and Australia – namely, weak competition and a ‘two-tier’ market in which the benefits of competition accrue primarily to active switchers, while disengaged customers face higher prices. In particular:

- Over 40% of customers have never switched retailer, and the majority of switches that do take place are due to moving house.
- The price difference between the incumbent and lowest price supplier is high and has been increasing over time. This pattern is the opposite of what would be expected in a competitive market.
- According to the Panel’s analysis in Figure 17 of the report, large retailers’ operating costs appear to have increased by 30-50% over the past decade. Again, this is not what would typically be expected in a competitive market.
- Incumbent retailers are engaging in increasingly aggressive ‘win-back’ strategies to retain switching customers.
- The widespread use of ‘prompt payment discounts’ imposes heavy penalties on customers who do not pay on time, and makes it more difficult for customers to compare price plans. We note that Meridian Energy has recently announced that it will end the practice, acknowledging that the ‘discounts’ are “unfair to customers who struggle to pay their energy bills”.
- Adjustments to network charges often do not seem to be passed through to customers in a timely and transparent fashion. Vector recently elected to pay Transpower’s Loss Rental Rebates (LRRs) directly to customers, due to concerns that retailers would fail to pass these through in full.

The Panel’s analysis of retail billing data also that (as in the UK and Australia) vulnerable customers are over-represented among the disengaged group who are not benefiting from competition. We look forward to the Panel’s detailed analysis of this issue based on Statistics New Zealand and retailer data.

16. *What are your views on the assessment of barriers to competition in retailing?*

We share the concerns raised by independent retailers and others regarding the use of aggressive ‘win-back’ discounts by incumbent retailers. This represents a significant barrier to expansion by independent retailers and allows incumbents to maintain higher prices on their ‘sticky’ customer base – effectively imposing a loyalty tax. Electric Kiwi’s recent submission on win-backs noted that:

> *“If winbacks are measured as a percentage of trader losses Mercury and Genesis winbacks exceeded 70% of trader losses in April 2018. This shows that for the most aggressive incumbents their strategy has already converged to one of near exclusively focussing on the ‘switcher’ part of the market.”*

Although we welcome the EA’s investigation of the impact of win-backs, we are concerned that on this and other issues, they are unduly influenced by the large incumbent players. We note that there are currently no independent retailers represented on the MDAG, which has been tasked with investigating win-backs.

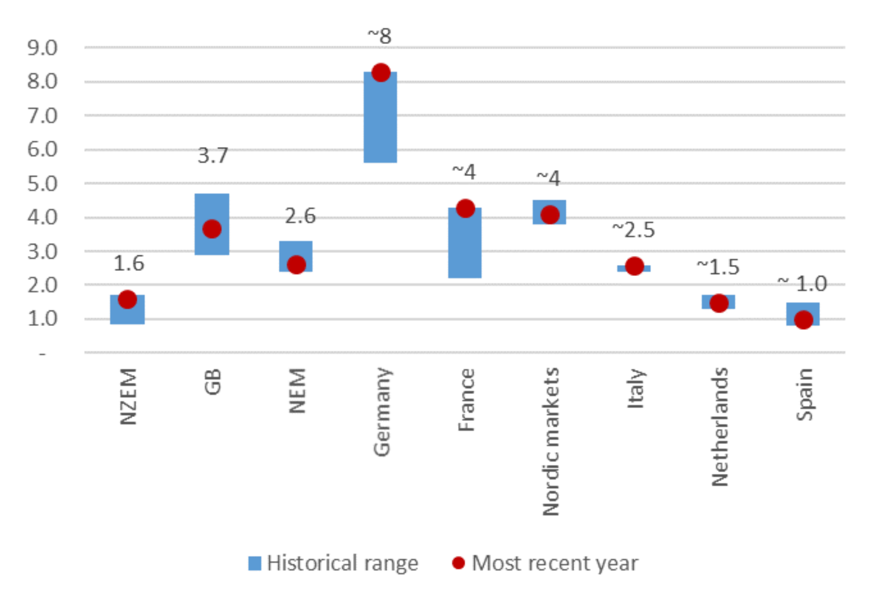
Vertical integration

17. *What are your views on the assessment of vertical integration and the contract market?*

We agree with the Panel's view regarding the importance of improving the depth and resilience of the contract market. Cumulus Asset Management has previously noted that "New Zealand stands out to us as having among the lowest levels of wholesale liquidity relative to its size, and one of the highest levels of vertical integration".[5] The Panel's report points to particular problems during winter 2017, when bid-offer spreads spiked as high as 15%. However, the spreads observed outside of this period are still very high compared to similar markets in other jurisdictions, and to markets for other commodities. For example, Ofgem data on the UK wholesale electricity market shows that spreads for forward contracts typically average 0.5% or less[6].

As shown in the chart below, the churn rate (volume of contracts traded relative to physical volumes) is also low in New Zealand – well below even Australia, where significant concerns have been expressed by the ACCC regarding vertical integration and poor performance in the contract market.

Contract churn rates – indicative international comparison



Source: CEPA analysis

The relationship between vertical integration and contract market liquidity can become a vicious circle. Vertical integration reduces incentives to trade in the hedge market, which reduces contract availability and liquidity. This in turn makes risk management more difficult for independent generators and retailers, raising barriers to entry and reinforcing the trend to vertical integration.

Further analysis of wholesale market liquidity can be found in the attached note prepared for Vector by CEPA.

18. *What are your views on the assessment of generators' and retailers' profits?*

[5] https://www.ea.govt.nz/dmsdocument/19666

[6] https://www.ofgem.gov.uk/system/files/docs/2016/08/wholesale_power_market_liquidity_annual_report_2016.pdf

One of the most important gauges of market performance is whether margins are consistent with what one would expect to observe under workable competition. It is therefore very disappointing to see that the Panel's analysis of generation and retail margins has been thwarted by a lack of data. As acknowledged on p7 of the Technical Paper, "…a comprehensive assessment would require detailed information on the capital and operating costs for generation and retailing activities. This data was not available."

Given these data constraints, the cashflow analysis presented in the report provides only limited insight. The analysis does highlight that cashflows to generators have increased over time, but no competitive benchmark is available for comparison and the analysis has not been able to distinguish between generation and retail cashflows.

To undertake a robust analysis of gentailer profitability, the Panel needs to answer (at a minimum) the following questions:

- How do generation and retail margins compare with benchmarks such as an estimated WACC or the costs of new entry (noting our earlier comments on the Panel's analysis of contract prices and the costs of new generation build?)
- Do retail margins differ significantly between 'incumbent' retailers and more recent entrants? And do retail margins differ significantly between vertically integrated retailers and independent retailers?
- How are margins split between the wholesale and retail arms of the business for the vertically integrated players? Are vertically integrated companies using reasonable transfer prices (e.g. based on forward contracts) for internal hedging?
- Do retail and wholesale margins vary by region? If so, are there particular factors that appear to be driving those differences, e.g., the continued strong presence of legacy retailers, transmission constraints?
- What has been the impact of gentailers' asset revaluations on declared profits? Are the large players using revaluation exercises to 'hide' excess returns?

If adequate data is not provided to the Panel to enable it to undertake robust analyses of generation and retail margins, this will substantially undermine the findings of the review.

Given the ongoing concerns regarding hedge market liquidity and transparency, we recommend that operational separation requirements should be imposed on the large generator-retailers as a matter of urgency.

Transmission

19. *What are your views on the process, timing and fairness aspects of the transmission pricing methodology?*

The TPM review process has fallen well short of regulatory best practice in almost every respect. Key issues have included: lack of a coherent problem definition from the start; lengthy delays; poor stakeholder engagement; and failure to adequately address criticisms of the proposals from the industry and experts.

The timing of the review makes little sense. Leaving aside whether the rationale for reform can be justified, the time to make changes would have been before Transpower's recent large capital investment programme took place – rather than afterwards, with retrospective allocation of the costs incurred. Also, now that the Government is looking afresh at the sector via the EPR, the EA should clearly await the outcome of the review before undertaking further work on TPM.

Throughout the TPM review, the EA has presented arguments about equity and user-pays (for example, that North Island customers have benefited the most from recent grid upgrades and should therefore pay more) dressed-up as efficiency arguments. Moreover, the EA's positions are subjective and flawed from both a fairness and an efficiency perspective. As the Panel's report notes, the EA's December 2016 proposal would have reduced charges on generators and increased the proportion paid by consumers, including those in poorer regions like Northland, King Country and Ashburton. It is difficult to see how this can be in the long-term interests of consumers.

Distribution

20. *What are your views on the assessment of distributors' profits?*

Limiting distributors' ability to earn excessive profits is one of the Commission's key goals when setting default price-quality paths (DPPs) under Part 4 of the Commerce Act. The fact that no EDBs have been found to be earning returns significantly above the regulatory WACC suggests that the regime is working well and delivering savings for consumers. Indeed, the Panel's analysis shows that the majority of EDBs have been earning returns *below* WACC since 2013.

We disagree with the allegations regarding the potential for distributors to cross-subsidise competitive activities via their monopoly network businesses. The Commission is actively monitoring this issue, and to date has taken the pragmatic approach that investments in new technology can generally be undertaken within the regulated business where they offer a lower-cost substitute for expanding network capacity. Furthermore, the Commission in April 2018 substantially strengthened its related-party transaction rules related to regulated vs unregulated activities. There are a range of services provided to regulated businesses that are provided on market competitive terms but are provided by partners of the regulated business. For example, Vector acquires vegetation management services for its network from Treescape, which is also owned by Vector. Treescape is a specialist tree-trimming firm which provides both utility grade vegetation management and arborist services for other purposes. The related party transaction rules enable Vector to demonstrate Treescape, as our vegetation contractor, was selected on merit to perform tree-trimming but also the terms of its services are comparable to market rates for equivalent utility grade tree-trimming.

Imposing blanket restrictions on network companies participating in 'competitive' activities would be administratively unworkable. It would require network engineers to undertake significant research as part of asset commissioning, to determine whether the asset could be delivered as a workably contestable service, or even a possible contestable service, in New Zealand. Alternatively, the Commerce Commission would be required to maintain a specific asset schedule for assets that could potentially be delivered through workable competition.

New technologies such as batteries and distributed generation are increasingly blurring the boundaries between the 'monopoly' and 'competitive' segments of the industry. This trend will accelerate in future. It is therefore essential to maintain a flexible and pragmatic regulatory approach to distributors' investment in new technology, to avoid creating unnecessary barriers and slowing down the pace of innovation.

21. *What are your views on the assessment of barriers to greater efficiency for distributors?*

Pricing

Discussions on pricing reform need to focus on the end consumer and encourage consumers' active participation around new pricing options. Pricing should be simple and easy to understand, rather than dictated by unnecessarily complex economic theories. Any reform must also be managed carefully to mitigate potential negative impacts, for example on vulnerable customers.

We are committed to trialling innovative pricing methods and are currently developing a trial for peak-time rebates (PTRs), which would reward customers for reducing their power usage during peak times, rather than penalising them. We are also collaborating closely with the ENA's work on distribution pricing reform. However, we caution against the assumption that changes to network pricing structures are the sole or even primary solution to the cost impacts of new technology such as electric vehicles (EV)s. In our view, innovative demand side management options such as controllable EV chargers and remote hot water control hold more promise than introducing complex tariffs.

EDB Size

There is little evidence to support the view that smaller EDBs are less efficient or that New Zealand has too many EDBs. A recent report by TDB Advisory found that headline differences in EDB operating costs are largely explained by differences in customer density. Similarly, a review of the international literature by George Yarrow found that New Zealand does not have an unusually large number of EDBs by international standards, and that there is "no convincing evidence of significant economies of scale in electricity distribution, other than at very small scale".

Metering data

We agree with the panel's view that metering data should be readily available on reasonable commercial terms so distributors can properly manage their networks. Access to meter data is also an important enabler for new energy services such as peer-to-peer trading, smart home energy management, EV charge scheduling, load shed participation, electricity brokerage and generation and battery aggregation. There are less complex methods of data exchange that do not incur the significant cost involved with a central repository – reliant of course on industry collaboration and commercially negotiated terms.

Asset management and planning

EDBs already prepare and publish a 10-year asset management plan (AMP) each year. We consider that this is an adequate planning horizon, particularly in the context of rapid technological change. In addition to the formal AMP process, EDBs also carry out long-range planning and strategic analysis for governance discussions. It would be incorrect to say that no thought is put into asset planning beyond the 10-year window of the AMP.

Ageing assets

We agree that some EDBs will soon face decisions regarding significant replacement and/or upgrade of older network assets. To minimise costs to consumers, it is critical that EDBs think innovatively about asset management and consider a full range of alternatives for managing their networks, rather than relying on traditional deterministic planning methods.

22. *What are your views on the assessment of the allocation of distribution costs?*
Changes to the cost allocation between residential and commercial have largely been a result of unwinding previous cross-subsidies. While there could be scope for some re-allocation of common costs back to I&C (particularly as the Commission moves to a revenue cap for next DPP) this would need careful consideration to avoid introducing distortions. We also consider that the analysis presented by the Panel is incomplete as it fails to take account of dividends paid back to customers via trust ownership. In Vector's case, Entrust provides a fixed dividend amount to each ICP on our Auckland network. This means that households receive the same dollar amount as commercial customers, and hence the effective distribution charge to residential customers on our Auckland network is considerably lower than the headline rates would suggest.

23. *What are your views on the assessment of challenges facing electricity distribution?*
We agree with the Panel that emerging technologies such as solar power and EVs will have a significant bearing on the future of the distribution sector. Our view is that the 'value adding services' and 'platform provider' models are not mutually exclusive, and that there is scope for EDBs to play both roles – particularly in the New Zealand context given the limited capital and expertise available to invest in new technology. As discussed in our response to question 20 above, technological change is increasingly blurring the boundaries between the 'monopoly' and 'competitive' elements of the industry, and it is essential that policy-makers and regulators take a flexible and pragmatic approach to avoid deterring investment and innovation. We are actively considering options for moving to more active management of the distribution system and which incorporate new technologies such as AI. EDBs are best placed to take on this operator role, to avoid introducing unnecessary complexity.

Summary of feedback on Part four

24. *Please summarise your key points on Part four.*
Fundamental questions remain about the degree of competition in the wholesale market, most obviously whether margins are reasonable and consistent with what one would expect to observe under workable competition. Most recently, Dr Stephen Poletti of the University of Auckland has demonstrated multi-billion-dollar market power rents being achieved over recent years by generators, including the three majority Government-owned gentailers. We are deeply concerned that the Panel elected not to acknowledge this research in its Issues Paper. The scale of market rents that Dr Poletti found in the New Zealand generation market are alarming and make nearly all other issues the Panel are examining pale into insignificance. The Review represents an important and valuable opportunity to provide clarity on these matters. The Panel's report also revealed significant problems with the way in which the retail market is currently functioning. The five incumbent vertically-integrated retailers continue to account for around 90 per cent of the market, and there is clear evidence of a 'two-tier' market emerging in which the benefits of competition primarily accrue to a small subset of actively engaged customers. With nearly half of New Zealand consumers not having switched retailers at any point over recent years (and therefore potentially paying hundreds of dollars over and above a competitive market price for their energy), we do not consider this to be a market that is delivering optimally for consumers. New Zealand stands out among international electricity markets as having some of the lowest levels of contract market liquidity and highest levels of vertical integration between generation and retail. A poorly functioning hedge market creates a significant barrier to entry and expansion of independent retailers. In addition, the opaque financial accounts of vertically integrated players mean that there is little information regarding the split between wholesale and retail margins and how this has changed over time. This undermines confidence in the market and (as the Panel has already discovered) makes it very difficult to assess margins and profitability accurately. The TPM review process has fallen well short of regulatory best practice in almost every respect. We continue to believe the EA's proposed TPM reform significantly ignores the benefits grid-connected generators receive from being able to transport their product across the country. The EA's proposed TPM in fact results in generators paying even less than the current 18% of total TPM charges. The proposed TPM will result in all generators funding only approximately 7% for transmission grid charges, and burdening consumers to fund the remaining 93%. Any changes to the TPM should result in all grid users, including generators, paying a fair share of the transmission grid instead of concentrating the costs of the grid onto end-users. The opposition the EA has encountered to its TPM proposals reflects active consumer opposition across so many regions of the country. There is an increasing onus on EDBs to not over invest in 40-year life assets while technology, disruption and uncertainty is occurring at pace. Physical networks for delivery of electricity not only need to be cost effective but also ready for new additions consumers will wish to connect such as EVs, PV and battery technology.

The options for EDBs to ensure existing physical network assets are optimised continue to grow, particularly around high-powered data-analytics and integration of new dynamically controlled smart devices. Similarly, consumers will want to be confident that their networks are investing in cost-effective alternatives to new network build, such as efficiency initiatives and investments such as LED lighting, where it is cost effective to do so.

Electricity networks have also traditionally planned with an "n-1" deterministic planning philosophy based on predicted 40-year load forecasts. However, a combination of technology and new business learning such as understanding customer behaviour and tends through smart meter data, active network management, controllable devices and demand control, grid storage, uncertainty of long-term forecasts – all point to such traditional planning processes needing to be modernised. In light of disruption, network planning philosophies will need to be refocussed to avoid overspend on sunk long-life assets with long-term embedded cost implications for consumers. Vector, which modernised its asset management philosophy over a decade ago (and already having saved Auckland consumers hundreds of millions of dollars in avoided capital expenditure), is happy to lead an industry-wide conversation to promote this change in approach to network planning and assist with an industry-wide transition to modernise network planning processes and avoid wasted capital expenditure.

The rise of the prosumer, multi directional supply and smarter, more connected and intelligent/aware energy platforms all mean that the role of the EDB is being progressively added to. Some EDBs are responding to such change by adopting new roles that complement the shift by customers, new technologies and new business models. Of course, the community still expects EDBs to perform their traditional role of limiting the instances of power outages. However, there is a growing expectation that EDBs must be trusted to perform active network management roles such as voltage and frequency stability, facilitating trading of energy over the "network as a platform" and coordinating the growth in distributed energy resources (DER) to manage peak demand constraints which have traditionally be addressed through physical network solutions. There will be an increasing need for the regulatory tools to recognise this change or otherwise risk regulation performing to past and not today's customers' expectations.

Solutions to issues and concerns raised in Part four

25. *Potential solutions to the issues and concerns raised in Part four.*

Recommendation #4: Take immediate steps to address the exploitation of market power by generators in the NZ wholesale market. This should include:

- Strengthening the existing rules for defining and mitigating "Undesirable Trading Situations", combined with a step-change in enforcement activity. Monitoring and enforcement powers to address market manipulation in the wholesale electricity market should sit with the Commerce Commission as New Zealand's lead competition regulator, particularly given the EA's failure to take action against recent clear breaches of trading standards.
- Ensuring that whoever has responsibility for market monitoring going forward has sophisticated market monitoring technology (such as that used in the financial sector) to identify irregularities.
- Reducing concentration in the generation market through, at a minimum, maintaining and expanding the current "virtual asset swap" arrangements. Given the evidence of substantial market power rents, the Panel should also look again at the option of transferring some generation assets to a new SOE to increase competition, as was considered in the Government's 2009 review.
- Examining options for wholesale market design that have been applied overseas, such as the introduction of capacity auctions to ensure that new generation is procured at least cost. This could be combined with a cost-based bidding regime in the spot market to mitigate market power.
- Reviewing the asset revaluation practices of majority Government-owned gentailers (Mercury, Meridian and Genesis) as compared to privately-held gentailers (Contact and Trustpower) to understand why the practices have differed substantially.

Recommendation #5: Address the current barriers to effective competition in the retail market by:

- Imposing a moratorium period on win-backs by incumbent retailers, similar to the regime that currently applies in telecommunications.
- Introducing regulations on prompt payment discounts. For example, the level of the discount must be reasonable (reflecting genuine differences in costs-to-serve), and discounts must be transparently applied to retailers' quoted tariff rates rather than incorporated within the tariff. Alternatively, conditional discounts could be banned entirely.
- Imposing requirements for full bill transparency so that each element of the bill is itemised separately (i.e. wholesale energy, transmission charges, distribution charges, retail costs/margin, and levy costs), and retailers transparently pass through network charges to end customers.
- Requiring the EA to trial interventions to increase switching by disengaged customers. These could include improved information, prompts to customers engage with the market, or even periodic auctions of the customer base to other retailers.
- Removing the remaining restrictions on EDBs entering the retail market to increase competition.
- Monitoring the retail market closely, and if significant improvement is not evident after a given time period (say two years), consider introducing a regulated default tariff to protect vulnerable customers.

Recommendation #6: Improve the functioning of the hedge market and provide consumers with greater confidence in the operations of New Zealand's large generator-retailers through a reset of transparency, liquidity and structural changes, including:

- Imposing operational separation requirements on the large gentailers, such that all hedging requirements are traded via the market and available on equal terms to all parties, rather than the current system of opaque 'internal hedging' within vertically integrated businesses.
- Further increasing transparency by requiring gentailers to publish annual segmented accounts. These would show revenue, cost and profitability metrics for generation and retail arms separately, calculated on a consistent basis across all companies. Ofgem's Segmental Statements regulations could be used as a guide.
- If operational separation is not pursued, introducing mandatory market making regulations on the large gentailers requiring them to offer baseload, peak period, and cap products in the hedge market, with regulated bid-offer spreads set at similar levels to comparable markets internationally.
- Reviewing the current arrangements for hedge contract transparency to ensure that they are working effectively.

Recommendation #7: Introduce a Government Policy Statement to guide the development of the TPM. This should specify that there is no economic rationale for allocating historic sunk costs retrospectively, and that it is inherently unfair to transfer welfare away from consumers in favour of a few producers.

Recommendation #8: Transfer the lead responsibility for both transmission and distribution pricing to the Commerce Commission.

Recommendation #9: Promote EDBs and Transpower to review their asset planning philosophies with a view to moving away from historic and traditional "N-1 deterministic" planning techniques that, in the face of emerging technology and disruption, risk over investment in physical network assets.

Recommendation #10: Maintain the current arrangements for regulating access to distribution networks to avoid creating barriers to EDB investment in new technology.

Recommendation #11: Ensure that distribution pricing reform focuses on the needs of the end consumer rather than 'textbook' economic models. Allow EDBs flexibility to explore technological options for managing peak demand in the context of emerging technology rather than focusing exclusively on pricing.

Recommendation #12: Address data access issues, most critically by implementing the EA's proposals around Multiple Trader Relationships that will enable multiple parties to simultaneously access smart metering data.

Recommendation #13: Remove the low-fixed charge regulations, but manage any adverse impacts on vulnerable customers e.g. through transitional arrangements.

Part five: Technology and regulation

Technology

26. *What are your views on the assessment of the impact of technology on consumers and the electricity industry?*

We are glad to see the Report highlight the emerging ‘bottom up’ market, which is at the core of a customer-centric electricity market. As technology advances, consumers will increasingly be empowered to choose how and from whom they will satisfy their energy needs – with grid supplied energy but one of many competing alternatives.

We wholeheartedly agree that distribution businesses will need to embrace new technology to handle the increasing demand fluctuations in the electricity market.

We have a proven track-record of embracing new technology, such as peer-to-peer trading, electric vehicle infrastructure, and solar power, to improve the flexibility and security of the energy network for the benefit of consumers.

Distribution businesses have the strongest incentives to cap peak demand and therefore embracing new technology is a natural fit.

The Report notes the significant role EVs will play in the future of the electricity market. EVs will disrupt energy market business models, creating unpredictable patterns of demand.

We are seeing clear trends of longer-range vehicles, requiring larger capacity batteries, and customer behaviour that suggests a trend towards faster charging times and clustering of chargers in certain areas on the low voltage network. A single EV household has the potential to increase its electricity capacity needs between 100% for very slow trickle charging, and 2000% for rapid charging. This is essentially adding between one and 20 additional ‘homes’ in terms of network capacity.

Technology is available to set controllable EV charger standards before uptake increases exponentially, capping peak usage and limiting the costs imposed on the network. Registration of EV connections and charger types would also facilitate co-ordination of electricity distribution planning and operation to reduce costs. We need to think now about the consequential impact of clusters on the low-voltage network, to ensure we avoid substantial price increases through unnecessary network investments.

The ability of technology to improve energy efficiency will also be a key driver for alleviating energy poverty in future. We are happy to share analysis with the review panel, which highlights that low-income consumers have significantly higher electricity usage. By way of example, our data analysis across Auckland households reveals:

- average Auckland annual consumption has decreased by 1% each year for the last 10 years;
- The most deprived households have benefited least from the 1% per annum average decline in energy consumption over the last 10 years;
- The efficiency gap between poorer and wealthier homes is estimated at 7kWh/m2 ($2/m2);
- Common consumption profiles exist across a range of socio-economic and geographical attributes of customers; and
- Energy usage increases with number of occupants, with children approximately using the same amount of electricity than adults.

Based on recent analysis from EECA, consumers can potentially save up to $1400 annually through energy efficient behaviour and adoption of very low-cost technology (wrap hot water cylinder, switch to LED lighting, use low-flow shower head, use cold clothes wash etc).

CASE STUDY: PONO HOME ENERGY EFFICIENCY AUDIT

Pono Home, based in Honolulu, provides free green home audits to assess what is causing consumers to spend too much on their utilities bill via a 100-point checklist. This includes an assessment of appliances, electronics, lighting, building envelop, leaks, and much more. For those in government/affordable housing, the audit's recommendations are implemented for free. This is paid for via consumers donating additional funding when they pay for their recommended services. The state electricity regulator also accepts energy efficiency measures as legitimate utility spend/investment due to the significant benefits for vulnerable and low-income consumers. Pono Home also reports on the carbon emission reductions they have achieved. The company has been funded by Elemental Excelerator, an international organisation which funds start-up co-designing and co-developing projects and strategies that improve infrastructure and sustainably enhances communities. Vector has been a member of Elemental Excelerator's Global Advisory Board since 2017.

The graph below, produced by Pono Home, is an example of the opportunities just LED light technology alone can provide consumers, with significant energy savings offering a short payback period:

LED Bulb:	Price:	Savings:*	Carbon emissions reduced:**
LED A19 100W	$12.00	$18.73	116.49
LED A19 60W	$5.50	$11.51	71.58
LED A19 40W	$6.00	$7.45	46.32
LED A15 40W	$5.00	$8.50	63.88
LED R20	$8.00	$9.48	58.95
LED BR30	$12.00	$12.19	75.79
LED BR40	$11.00	$16.25	101.05
LED B11	$6.00	$8.12	50.53
LED G25	$6.25	$7.90	28.21
LED MR16	$10.00	$9.70	60.35
LED PAR16	$23.00	$9.70	60.35
LED PAR30	$13.00	$13.99	87.01

**Estimated savings are annual in USD.*

*** Carbon emissions reduced annually, measured in lbs.*

With the advent of 'internet of energy' network technology and the use of advanced data analytics, there are exciting possibilities emerging to help deliver a fairer, more consumer-controlled energy future that serves to minimise inequities.

CASE STUDY: OPTIMISING AND MANAGING ENERGY FLOWS

Vector is working to manage complex systems in much more sophisticated ways through unprecedented integration of information and operational technologies. This supports customers to utilise automation to optimise energy use and cost. This mPrest 'system of systems' will sit over Vector's customer, market, distributed energy resources (DERs), and network systems to manage their performance in real time. Through self-learning, it will be able to build 'the story of the networks' based on what has happened historically and use artificial intelligence to optimise numerous objectives.

The mPrest system challenges the traditional mindset that has seen energy companies growing their networks to accommodate greater peaks. It also helps defer network reinforcement costs, reduce the risk of stranded assets, and promote a rapid increase in new solutions to generate and manage energy.

As highlighted in the Report, obtaining the benefits of the emerging disruption in the electricity market will depend largely on access to consumer and consumption data. Granular energy data is critical to ensuring innovation is occurring to meet the long-term needs of customers.

Access to meter data is an enabler for several new services encouraging competition and mass participation; peer-to-peer retailing, smart home energy management, EV charge scheduling, load shed participation, electricity brokerage and generation and battery aggregation. EDBs also need to leverage data to proactively improve grid planning and operations, determine asset life, optimize asset investments, prioritize reliability planning, integrate DERs, and pre-emptively address common causes of asset failures. We have strongly evidenced that EDB's can use data analytics to lower the overall cost of the network, our track record shows hundreds of millions saved due to proballistic planning.

It is positive to note that data and data exchange is a central work programme for the EA, which we will continue to engage with and drive for change. There are practical methods of data exchange that do not incur the significant cost involved with a central repository – reliant on industry collaboration and commercially negotiated arrangements.

We also note that the Australian Government is introducing the Consumer Data Right (CDR), which allows consumers to authorise their service providers to share their consumption and transaction data to accredited third parties, and benefit from it. The CDR is being implemented initially in the banking, telecommunications, and energy sectors. This will be a key development in data access for New Zealand to learn from.

27. *What are you views on the assessment of the impact of technology on pricing mechanisms and the fairness of prices?*

Pricing reform is currently a priority for both the ENA and EA, and workstreams are underway by both parties, with a number of EDBs also trialing innovative pricing structures.

Adjusting pricing structures will create winners and losers among consumer groups. Peak-time tariff penalties and cost-reflective pricing may not provide the equitable outcomes hoped for. In fact, international case studies illustrate that low-income consumers are likely to be worse off under cost-reflective pricing. We are happy to share the findings of these case studies with the Panel.

It is vital that pricing mechanisms are simple for consumers and do not penalise technology or have a technology bias. We firmly believe in rewarding rather than penalising consumers and have advocated for pricing innovations such as Peak Time Rebates. We are happy to share further details on this pricing mechanism with the review panel, which has been highly successful internationally.

CASE STUDY: MANAGING EQUITY THROUGH PEAK TIME REBATES

After experimenting with different rate designs over several years, Baltimore Gas and Electric (BGE) designed a peak-time rebate programme for all of its residential customers who have smart meters. Called Smart Energy Rewards®, the program provides 1.1 million residential customers an opportunity to earn $1.25 per kilowatthour (kWh) on Energy Savings Days. From the introduction of the scheme in 2013 to the end of 2016, BGE customers have earned nearly $40 million by reducing energy usage during periods of peak demand on hot summer days.

BGE partners with Opower to deliver personalized, multi-channel communications before and after events, using customers' preferred channel of communication (phone, email, or text).

Ready and timely access to half-hourly consumption data is key to the programme – any delay affects the feedback loop, potentially weakening engagement and, ultimately, the savings achieved.

Pricing reform should not be viewed as the only, or even primary, solution for addressing peak electricity usage. In our view, the Report pays insufficient attention to the potential for technology to automatically adjust demand profiles, such as through hot water load control. A recent Vector trial shows 25 percent peak shaving can be achieved through this control measure.

At high EV penetrations, pricing adjustments may not be sufficient to mitigate the impact on local low-voltage networks. Time-of-use tariffs may provide short-term cushioning for network impacts at today's low levels of EV uptake, but longer range/ larger battery size EVs, combined with the reducing costs of EV fast chargers, will undermine pricing alone as a credible means of avoiding peak capacity levels being breached. A tariff is also a static price signal which does not reflect how EV owners respond to those price signals. An ill-suited time-of-use tariff can create a 'trigger peak' that rapidly exceeds the current evening peaks.

Charging technology that allows dynamic scheduling of EVs through greater coordination of individual chargers would enable smart utilization of network capacity throughout the day. “Smarter” charging has an added customer benefit of enabling EV users to become market participants whereby, for example, the aggregated, dynamic EV battery load can supplement the generation mix and add to community resilience.

28. *What are your views on how emerging technology will affect security of supply, resilience and prices?*

Technology, regional independence and shared capacity must be recognised as enablers for achieving a resilient electricity system.

Recent events locally and internationally reinforce the need for more innovative thinking around the principles for resilience. The severe storms in South Australia in December 2016, Hurricane Sandy in New York in October 2013 and the 2011 Japanese earthquake and tsunami resulted in radical departures in electricity network design.

In Japan, where resilience has been a central focus for the redesign and rebuilding of the country’s power system, regional autonomy and local consumption has been the model for achieving electricity resilience. The northern regions of Japan have been redesigned with a significant focus on micro grids to deliver resilience from similar events to the 2011 earthquake.

The approach these jurisdictions have taken to reconstructing their electricity system for resilience is in marked contrast to New Zealand. The rebuilding of Christchurch and the post-mortem from the Kaikoura earthquake have generally not considered the advantage of new energy technologies for resilience. Enabling local independence and shared capacity in electricity systems are critical enablers to withstand and rapidly respond to external events. We strongly encourage regulators and policy makers to consider recent international events.

We have prioritised technology-focused solutions and the use of data and data analytics, to help understand the impacts of emerging technologies on the resilience of our network. We believe that technology is the partner to renewable energy generation, to ensure security of supply and resilience. We are happy to share with the review panel our analysis of electric vehicles, vehicle-to-home charging infrastructure, learnings from our peer-to-peer trial, as well as the solar and battery home solutions we rolled out in South Auckland.

While the Report questions the ability of EDBs to handle emerging technology on their networks, the reality is that networks are already absorbing this technology, while managing resilience. It is also vital to remember that emerging technology, which can provide a control layer over DERs, is also scalable and transferrable. This means the solutions developed for one network, can be shared nationally. Therefore, the assumption that each and every EDB must be capable of handling disruptive technology is misdirected where such capabilities can be outsourced and nationally, or inter-regionally coordinated.

Regulation

29. *What are your views on the assessment of the place of environmental sustainability and fairness in the regulatory system?*

While we acknowledge the ideas laid out in the Report on the inclusion of environmental and fairness concerns in the regulatory framework, we believe that as electricity has a disproportionate influence over the environment, carbon considerations should be included in the regulatory framework for electricity, as is the case internationally, for example Ofgem in the United Kingdom.

We are not prescribing how carbon should be reviewed by energy regulators, simply that it should be a consideration in the decision-making process.

Resilience considerations are also missing from the regulatory framework. The current framework is focused on reliability (security of supply) rather than resilience, based on historical benchmarks. This does not recognise the exponential changes that are occurring due to new technology and climate change.

Industry participants cannot be expected to provide resilience for New Zealanders, while being hindered in their ability to achieve it under regulatory frameworks that do not recognise the significant impact of climate change, or the increasing criticality of electricity, for example.

MBIE’s Technical Working Group on Climate Change Adaptation was established in November 2016 to advise the government on how to build resilience against climate change and a stock take report was released in 2017 to help build an industry-wide understanding of risks associated with Climate Change. However, no further resilience policy and governance structure is in place to promote resilience.

A renewed focus must be given to developing:

- an agreed upon concept of resilience;
- an appropriate framework for measuring resilience to assess industry participants’ success; and
- regulatory recognition of the resilience framework, to ensure there are appropriate incentives for action.

30. *What are your views on the assessment of low fixed charge tariff regulations?*

It is widely acknowledged that the Low Fixed Charge (LFC) Tariff has unintended consequences and is not delivering for low-income consumers. The Panel's analysis of retail billing data found that the net benefit to consumers in deprived areas is broadly neutral, but that the regulations have other effects that are detrimental. We are happy to share analysis with the review panel, which highlights that low-income households in fact have significantly higher electricity usage per square metre.

We believe that energy efficiency, combined with measures to improve the functioning of the retail market, is a much better way to assist customers in energy hardship. Based on recent analysis from EECA, consumers can save up to $1400 annually through energy efficient behaviour and adoption of very low-cost technology (wrap hot water cylinder, switch to LED lighting, use low-flow shower head, use cold clothes wash etc). If households increased efficiency, were on the right tariff, and could utilise the prompt payment discount, there would be a significant reduction in their electricity bill.

Industry participants and regulators can support energy efficiency and reduce consumer electricity bills by; supporting EECA's work programme, encouraging energy literacy in schools (such as Vector's 'Being sustainable with Energy' programme), providing energy efficient lightbulbs to vulnerable consumers, supporting home insulation programmes, enabling EDBs to put solar PV and household batteries into their RAB for vulnerable consumers to access renewable energy and better manage their electricity requirements, and incentivising load control technology to flatten peak demand and reduce network costs (as a corollary to this, there should be greater transparency to ensure that reduced lines charges are passed through to consumers, as there is currently no assurances or requirement for this).

If the LFC is retained, it is critical that retailers ensure consumers are on the correct plan. Based on 2017 annual consumption, over 15% of Auckland households remain on the wrong lines tariff (80% of these are on standard tariffs when their consumption reveals they would be better off on the low user tariff, equating to paying an excess of $121 per annum). Only retailers are permitted to move customers onto the correct pricing plans.

31. *What are your views on the assessment of gaps or overlaps between the regulators?*

It is clear that there are significant areas of overlap and disagreement between the two electricity regulators, as is made obvious by the regulation of access to distribution networks and use of system agreements.

The two regulators have publicly disagreed on fundamental aspects of EDBs' operation, for example the EA stating in public forums that revenue caps should not be pursued, while the Commerce Commission pursues these under the Commerce Act.

The two regulators have also been poor at coordinating their workstreams, with the EA running consultations on transmission pricing, at the same time as the Commerce Commission is reviewing input methodologies, limiting the scope for true engagement with industry participants.

Due to regulator tension, the role of EDBs in the roll out of new technology is unclear, which has significant flow on effects for innovation and R&D. The issue has been reviewed by the Commerce Commission, during its Input Methodologies review, and by the EA during its Mass Market Participation review, which relitigated the issues considered the year prior by the Commerce Commission.

The Commerce Commission, New Zealand's competition regulatory specialist, ensures that distribution businesses face strong efficiency, quality and reliability incentives, and that the costs of competitive activities are not compensated in the regulatory regime. As the competition specialist, the Commerce Commission is best placed to act on matters concerning EDB support of innovation and new technology. There must be stricter boundaries on the work programmes of each regulator. We suggest that the Commerce Commission should take responsibility for all aspects of distribution and transmission regulation. There may also be merit in moving competition monitoring functions to the Commission, with the EA retaining responsibility for market rules.

There should be an identified market failure before intervention in any market is considered. There does not appear to be any market failure with regards to open access in the electricity market. In Auckland, there are more than 400 embedded/customer networks, 2500 distributed generators connected since 2013, and over 25 retailers operating on our network. Anyone can connect solar or battery technology to a distribution network, anyone can start peer-to-peer electricity trading on a distribution network, and anyone can start a digital platform aggregating demand on a distribution network. Open access for participation on distribution networks is the status quo.

CASE STUDY: OPEN ACCESS ON VECTOR'S NETWORK

- ***30+ non-Vector EV chargers***
- ***3500 solar panels***
- ***170+ embedded networks***
- ***64% of Aucklander's have Metrix meters (not Vector-owned AMS meters)***
- ***30+ retailers all under negotiated UOSAs***
- ***3rd party field service crews***
- ***Chorus UFB co-location***
- ***Transpower cross-city tunnel***

Where there are opportunities for distributors to provide new innovative services for network resilience or load management, they should be able and incentivised to do so because:

- Prescriptive regulation is widely regarded as inefficient in an industry facing increasing rates of change and innovation. Regulation needs to evolve to output-based regulation to meet increasing consumer expectations.
- Where a viable party with both the technical expertise and will is prohibited from delivering innovation it will have an even more detrimental impact on New Zealand consumers given the relatively small size of our country.
- Local EDBs do not generally own old generation assets and therefore have a greater incentive to bring forward new technology than generator-retailers for the benefit of all communities.
- EDBs are the only industry participants required to target efficiency. While other participants earn revenue from peak demand, EDBs are focussed on capping this peak. Investment in new technology decreases infrastructure expenditure and does not displace existing investment/revenue streams, as it does with generator-retailers.
- EDBs are connected to the regions, and the majority are owned by consumers. EDB involvement in new technology is therefore essential to promote technology distribution in rural communities.
- As has been seen overseas, there are unintended consequences of EDB exclusion in new technology, with plummeting R&D requiring government subsidies, as was the case with EV infrastructure in California, and battery roll out in Australia.

The New Zealand policy and regulatory approach, at least for now, appears to implicitly recognise the potential large-scale benefits from allowing EDBs to invest in emerging technologies like batteries. However, for electricity distributors to fully contribute to the roll-out of battery and other innovative technology, maintaining the status quo is unlikely to be sufficient, as the threat of policy and regulatory interventions is ever present and has a chilling effect on large-scale investment.

To encourage competition, EDBs could have more active monitoring of related party transactions, and provide extended information disclosure by providing 53ZD filings annually (whether written or verbally presented). We are also happy to table our information protocol to support industry best practice.

Embracing new technology is vital, and if technology benefits network operation, EDB's should be encouraged to invest, and if the technology creates benefits outside of the network, these should be transparent.

32. *What are your views on the assessment of whether the regulatory framework and regulators' workplans enable new technologies and business models to emerge?*

We agree with the Report's conclusion that the electricity regulatory framework was largely designed for yesterday's technologies and businesses models.

The regulatory framework needs to be amended to achieve innovations such as peer-to-peer trading and multiple trading relationships. These amendments need to be prioritised, as these work programmes are receiving limited momentum within the EA currently.

The growth of solar consumer-generators and people using electric vehicle-to-grid technology will open opportunities for multiple parties to provide services to a single customer. But enabling that will require more sweeping changes than the EA has suggested, including to the fundamental relationship between distributors and consumers.

By enabling consumers to establish trading relationships with multiple electricity services from one ICP, that would avoid the need to install additional meters and encourage further innovation in consumer services such as price-comparison websites, home energy management systems, peer-to-peer generation trading, demand-response and aggregation services.

Consumers will benefit whether they participate in multiple trading relationships or not. The threat of competition will push retailers to lift their game.

EDBs need to respond to changing customer expectations by adopting new roles that complement the shift by customers. This will involve the responsibilities of EDBs increasing. The community still expects EDBs to perform their traditional role of limiting the instances of power outages and time without power currently measured through the indices SAIDI and SAIFI. However, there is a growing expectation that EDBs must be trusted to perform active network management roles such as voltage and frequency stability, facilitating trading of energy over the "network as a platform" and coordinating the growth in distributed energy resources (DER) to manage peak demand constraints which have traditionally be addressed through physical network solutions.

Given the changing customer expectations for EDBs to perform new roles there is a need for the regulatory tools to recognise this change. Failing to recognise the change in the regulatory tool kit risks regulation performing to past and not today's customers' expectations. This will undermine the ability of EDBs to adapt to their new roles given there is no explicit regulatory incentive to adopt the new roles.

There are a range of regulatory tools that can be adopted. They range from simply reviewing the measure of reliability to be more personalised, to more explicit incentives for EDBs to invest in the capability to support their new roles. Many of the regulatory tools are available to be adopted in the current regulatory framework and should be considered as part of the recalibration of price-quality path for the 2020-2025 period. While other regulatory tools should be considered for more longer-term reform of the regulatory tool kit. We are happy to provide the Panel with work we have undertaken in this area to increase their understanding of this fundamental issue for EDBs.

To create greater retail competition the remaining regulatory barriers for lines businesses to retail should also be removed. EDBs have the balance sheet to provide competition in the market and have 20 years of regulated transparency which would show case any cross-subsidisation issues.

33. *What are your views on the assessment of other matters for the regulatory framework?*

We agree with the need to increase consumer voice and education, as has been outlined in part three of our submission.

We also support review of the EA, as it is unbalanced that no EA decision is open to legal challenge on its merits while Commerce Commission decisions are open to challenge in the courts. When the EA makes continued attempts to retrospectively regulate, as occurred during the Transmission Pricing Methodology work programme, serious questions must be asked regarding regulatory errors and the ability for redress.

Regarding regulatory costs, the time will come when EDBs no longer need to be regulated, because emerging technology will create increased competition, substituting the natural monopoly services which are currently in place. Therefore, we wish to highlight that this cost will continue to decline as regulation falls away with the decreasing natural monopoly status of EDBs.

We would like to acknowledge the extensive judicial process that occurred when determining input methodologies. All industry parties participated fully in this process, with considerable consultation, time, financial resources, and expert opinions expended.

Summary of feedback on Part five

34. *Please summarise your key points on Part five*.

Technology has an ever-increasing powerful role to play in NZ's electricity future

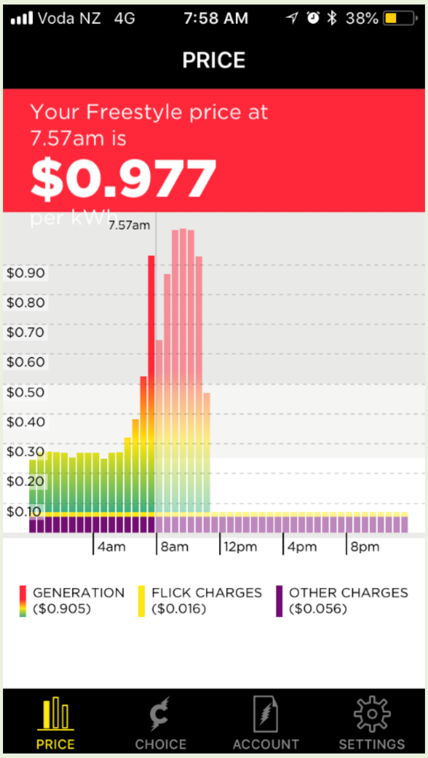
As an enabler, new technology will unlock for consumers greater choice, increased resilience, lower costs, and a reduction in carbon.

Regardless of what some in the industry may say or believe, industry disruption will march on and all in the sector have a responsibility to stay ahead of the technology curve, embrace change and meet the needs of customers, tomorrow as well as today.

For the capital-intensive parts of the electricity supply chain, technology (typically with declining cost curves) is unlocking more efficient and more flexible options beyond traditional 40+ year capital expenditure. Where industry can deliver service more efficiently through embracing new technology, this equates to savings for customers - today and tomorrow.

For the electricity network operators, this customer interest is reinforced by the statutory purpose statement of Part 4 of the Commerce Act, to promote the long-term interests of end-users. For example, new technology assets such as storage, that EDBs may seek to invest in could not only avoid the need for expensive builds but may be able to be used by customers to lower their retail costs. Assets used in one element of a customer bill (distribution) capable of lowering costs in other components of a customer's energy bill, is clearly in the long-term interests of consumers.

We need only to look at energy prices this month in New Zealand to appreciate what increased storage and distributed generation can offer consumers by way of cost savings. The image below is the Sunday morning price of grid-connected electricity (14 October 2018):



While new technologies serve to mitigate network congestion peaks, many such as storage and controllable load/devices have the added advantage of creating broader capability such as "virtual power plants" where capacity is achieved though demand curtailment largely invisible to customers, rather than increased generation.

The Internet of Energy is fast becoming a reality with demand response able to serve network *and* generation peaks without new generation or network build. Even better, as consumer and third-party owned storage and technologies grow, aggregation will offer a new source of competitive market constraint on generation and the exercise of market power.

A further, yet critically important, benefit distributed generation and storage can bring to communities is resilience. While this is only now starting to be recognised and understood, it reinforces the multiple values consumers and communities will increasingly attribute to locally-owned and operated technologies in their communities.

Access to distribution networks

We disagree with the allegations regarding the potential for EDBs to cross-subsidise competitive activities via their monopoly network businesses.

The Commission is alert to, and actively monitoring this issue, and to date has taken the pragmatic approach that investments in new technology can generally be undertaken within the regulated business where they serve to deliver the lines service. Furthermore, the Commission in April 2018 substantially strengthened its related-party transaction rules related to regulated vs unregulated activities.

New technologies such as batteries and distributed generation are increasingly blurring the boundaries between the ‘monopoly’ and ‘competitive’ segments of the industry. This trend will accelerate in future. It is therefore essential to maintain a flexible and pragmatic regulatory approach to distributors’ investment in new technology, to avoid creating unnecessary barriers and slowing down the pace of innovation.

As has also been seen overseas, there can be significant unintended consequences of EDB exclusion or limitation in new technology, with reduced R&D spending requiring government subsidies, as has been the case with electric vehicle infrastructure in California, and battery roll out in Australia.

In the case of a small economy such as New Zealand, constraining a viable party with both the will and technical expertise from delivering innovation will have a highly detrimental impact on consumers.

EDB participation in DG and storage could provide a credible, much needed competitive constraint on generator market power

Given the incentives in the market, there is an increasing case for EDBs (the majority of which are community-owned) to play an active role in owning and/or coordinating the output from distributed generation and storage.

The concerns the Panel expressed regarding the exercise of market power in the generation market reinforces this position.

In addition to reducing stress on network infrastructure during peak times when capacity constraints emerge, distributed generation and storage can be used to lower wholesale market costs. Driven by the need to manage spikes in demand, networks have the incentive to increasingly turn to storage as an effective means to “flatten the peak” and avoid expensive additional capital expenditure on traditional infrastructure, enabling cost savings to be passed onto consumers.

The reality is there is little to no incentive for other parts of the sector to focus on “flattening the peak”.

While Vector is not yet aware of EDBs currently using grid level storage to constrain peak pricing in the generation market it is occurring in other markets. Furthermore, such an activity could be transparently and openly accounted for under existing regulatory settings.

As an elegant example of a win-win-win scenario, beyond the network and competition benefits, distributed generation and storage will also have environmental benefits, helping to reduce carbon emission (for example, where carbon-zero distributed generation displaces carbon emitting generation - geothermal, gas, coal and diesel – all of which are being used in New Zealand's Spring 2018 electricity generation).

The potential wholesale market, environmental and network benefits of distributed generation highlighted above are highly dependent upon where storage and distributed generation is located, the type of plant, when energy is exported and its reliability. The prospect of securing and delivering each of these benefits to consumers – and avoiding the incurrence of unnecessary costs – can be enhanced substantially through the involvement and the utilisation of balance sheets, for example, of community-based EDBs.

Nor would the involvement of EDBs in such activities preclude other potential suppliers from competing. Distribution networks are already 'open access' platforms:

- anyone can connect solar technology;
- anyone can connect a battery;
- anyone can start peer-to-peer electricity trading; and
- anyone can start a digital platform aggregating demand.

In our view, we have a responsibility to consumers to ensure our network becomes an intelligent energy platform and eco-system that enables new technologies, new innovations, and new retail competition to flourish. This will enable consumers to become prosumers and, in doing so, promote competition and lower costs for consumers.

EDBs the key EV enablers

EVs are a significant opportunity to reduce New Zealand's carbon footprint and lower customer bills by better transitioning to electrification. In addition to having significantly lower emissions, EVs can help integrate intermittent renewable generation through intermittent charging and reverse vehicle to grid flows. However, as with other types of DER, if EV adoption and use is not properly integrated into the existing network, EV charging could significantly increase future system costs for consumers.

The impact of EV uptake on the network, and hence the need for network reinforcement, is likely to depend on how the network is operated. For example, the way in which network services are offered may influence EV charging during the network's system peak and where they are charged. Controlled charging could act as a form of demand response thereby avoiding some of the network reinforcement that would otherwise be required.

Underprepared networks for EV growth may present a hurdle to ensure the connection and augmentation needs presented by EVs can be smoothly accommodated by networks. Flexibility and support in the regulatory design should be enabled to ensure networks are supportive of the opportunities EV take up presents for the country.

Regulatory clarity and consistency lacking

It is interesting to note how much of the EA's work programme is dedicated to addressing EDB issues- in the context of a regulatory framework where the Commerce Commission supposedly retains comprehensive regulatory responsibility over EDBs.

The increasing focus of the EA on EDBs in parallel to the Commerce Commission comes at the expense of resource and attention on those layers of the supply chain (wholesale generation and retail) assumed by policy makers to be the primary focus of the EA. We encourage the Panel to review for themselves the work programme of the EA (and indeed the EA's submissions to the Panel) to understand the present balance of the EA's focus.

Where this focus is becoming increasingly challenging is in the adoption of technology in the electricity sector. There is increasing uncertainty surrounding the regulatory overlap of the EA and Commerce Commission. Recent examples highlight the dual efforts of both regulators in the area of EDB technology and service levels:

Electricity Authority	Commerce Commission
The EA is currently undertaking a study into the efficiencies of EDBs	The Commerce Commission has the express statutory mandate to improve EDB efficiency and for EDBs to act in the long-term interest of consumers
The EA has recently commenced a study into the strategic implications of emerging technologies for EDBs and how they might adapt in response to the changes	The Commerce Commission has also just undertaken a section 53ZD request relating to the use of emerging technologies of all EDBs and published information summaries on its website
The EA proposes to define comprehensive service quality terms via its proposed Default Distribution Agreement despite their empowering Act expressly prohibiting the EA via Code amendments to "purport to do or regulate anything that the Commerce Commission is authorised or required to do or regulate"	The Commerce Commission administer a price/quality regime for regulated EDBs. The issue is presently before the Court of Appeal relating to a declaratory judgement of clarification that Vector has sought

Beyond the area of new technology, we have also seen the EA openly criticise the Commerce Commission's decision to move to revenue-cap based regulation. In such a fundamental aspect of the regulatory regime it was highly unusual to see two regulators take such diametrically opposed positions and, in doing so, undermine the certainty that is sought through the Commerce Commission's Part 4 regulation.

It is increasingly obvious to Vector that the Commerce Commission, both as the specialist competition body as well as regulatory body overseeing EDB regulation, needs to have remit for the oversight of EDB's and new technology. Work programmes must be clearly defined and sitting with one responsible body.

Similarly, given the inherent nature of a price/quality regime, it is only the Commerce Commission that can comprehensively administer a regime where price and quality are inherent trade-offs.

Access to smart metering data

As highlighted in the Report, obtaining the benefits of emerging disruption in the electricity market will depend largely on access to consumer and consumption data.

The greater understanding all industry participants have about customer energy usage, the more innovation will be enabled to meet the long-term needs of customers. For example, granular data access by EDBs will support technology change, up-to-date outage information, network management/planning and support networks to build efficient, lower cost smart networks. Without granular data, EDBs are forced to make assumptions about household trends critical to broader network peak calculations.

Access to meter data is also an enabler for new services that can promote competition and greater consumer participation in the market. For example, smart meter data can enable peer-to-peer trading, smart home energy management, electric vehicle charge scheduling, demand response participation, and electricity brokerage and generation and battery aggregation.

The work of the EA on Multiple Trader Relationships is urgently needed to enable consumers greater choice between retailers in real time. Multiple Trader Relationship reform is also a fundamental enabler of smart networks.

EDBs will need to increasingly leverage data to proactively improve grid planning and operations. Vector has evidenced that EDB's can use data analytics to lower the overall cost of the network. Vector is happy to share the network planning and management value that can be achieved with smart metering data along with its information protocol to encourage best practice for data use and security.

It is positive to note that data and data exchange is a central work programme for the EA, which Vector will continue to engage with and drive for change.

There are significantly less complex and costly methods of data exchange than a central repository, as identified by the Panel. We encourage the panel to endorse an approach that relies upon commercially agreed terms, which has always been a strong feature of the smart metering market. For example, where EDBs do not currently have rights to data then these can be negotiated and implemented through commercial arrangements.

Pricing Innovation

Lines charges should be simple and designed to align with what customers experience nowadays in other services. Overly complex pricing to deliver text-book cost-reflective pricing risks adding significant complexity and uncertainty to consumers' bills and their overall understanding of energy costs. The Panel is also right to observe that any pricing reform involves winners and losers. Our research to-date reveals that vulnerable customers are overly represented in seeing price increases following the introduction of cost-reflective pricing.

It is also vital that pricing mechanisms do not penalise technology or have a technology bias.

Vector firmly believes in rewarding rather than penalising consumers and has advocated for pricing innovations such as Peak Time Rebates. Vector are happy to share further details on this pricing mechanism with the review panel, which has been highly regarded internationally.

Security of Supply

New Zealand cannot be complacent about its electricity security of supply.

Technology, regional independence and shared capacity must be recognised as enablers for achieving a resilient electricity system. Whilst security of supply has always been a focus for the industry, it is only very recently that policy attention has shifted to the resilience of the energy system.

Recent events both locally and internationally reinforce the need for more innovative thinking around the principles of resilience. For example, severe storms, anticipated to increase with global warming, has seen a radical departure in electricity network design in many countries to incorporate innovations such as microgrids.

Regulatory Objectives

While Vector acknowledges the issues in the Report on the inclusion of environmental and fairness concerns in the regulatory framework, Vector believes that as electricity has a disproportionate influence over the environment, carbon considerations should be included in the regulatory framework for electricity, as is the case internationally.

Vector is not prescribing how carbon should be reviewed by energy regulators, simply that carbon versus carbon-free electricity generation (as distinct from simply renewable/non-renewable generation) should be an express consideration in the decision-making process.

Resilience considerations are also missing from the regulatory framework. The current framework is focused on reliability (security of supply) rather than resilience, based on historical benchmarks. This does not recognise the exponential changes that are occurring due to new technology and climate change.

Low Fixed User Charge

It is widely acknowledged that the Low Fixed Charge Tariff has unintended consequences and is not delivering for low-income consumers.

It is critical that retailers ensure consumers are on the optimal pricing plan. This is a matter the Panel should oblige of retailers. Vector is aware of sustained periods where retailers, despite having the obligation to do so, have not placed consumers on the correct network pricing plan (i.e. on the low fixed user charge where consumers ought to be, or vice versa).

Solutions to issues and concerns raised in Part five

35. *Please briefly describe any potential solutions to the issues and concerns raised in Part five.*

Recommendation # 14: New Zealand regulatory and policy settings need to promote and encourage EDBs to fully utilise and explore emerging non-network technologies – especially when they can form lower-cost alternatives to traditional network-based investments and enable complementary sources of increased resilience and competitive constraint. Enabling smart networks to embrace, demonstrate and leverage the host of technology options emerging offers credible and cost effective means to defer or avoid large scale network investments. Critical to embracing new technology is endorsing that which is uncontroversial overseas - network companies harnessing smart metering data to better understand consumer energy patterns and deliver consumer value through further optimising network management and planning.

Recommendation # 15: Endorse the value in locally owned EDBs investing in storage and distributed generation and smart network technologies to address network constraints, whilst recognising the competitive and environmental benefits such investment can increasingly deliver. The Panel's concerns over the generation market underscore the value in such investment ultimately being able to exercise a competitive constraint and counter-balance on market power exercised in the generation market to the benefit of consumers. Existing and recently reviewed cost-allocation rules already accommodate the implications of service that have both a regulated and non-regulated component.

Recommendation # 16: Electric vehicle uptake offers one of the most significant carbon reducing opportunities for NZ. EVs will also build local resilience and empower customers with significant storable energy that will facilitate broader customer-centric innovations such as P2P trading. Locally owned/controlled networks are already charged with ensuring their communities and customers have choice about where, when and how fast they can charge their EVs. Policy settings supportive of the mass uptake of EVs and high-volume capacity charges needs to acknowledge the enabling role of EDBs, including through sensible adoption of smart dynamically operated EV chargers in the home or workplace. Where increasingly higher capacity EV charges can be synchronised with any pre-existing network capacity constraints, the need for significant network investment upgrades (and increased costs to customers) can be avoided.

Recommendation # 17: To avoid both the EA and Commerce Commission looking at the same issues in parallel (and contradicting each other on fundamental issues of quality regulation and new technology), clarify that the Commerce Commission has responsibility for price and quality regulation of EDBs as well as regulatory oversight for the adoption of new technology as part of existing Part 4 regulation and statutory objectives around innovation and efficiencies.

Recommendation # 18: Access to data will be a key enabler to disruption, both from existing players in the market but also international potential entrants and business models (such as when the Netflix of energy arrives). Implementing the EA's proposals around Multiple Trader Relationships that will enable multiple parties, including EDBs, to simultaneously access smart metering data is critical.

Additional information

36.	*Please briefly provide any additional information or comment you would like to include in your submission.*

Electricity Price Review Support – Responses to the First Report

22 October 2018

Vector

WORKING NOTE

IMPORTANT NOTICE

CONTENTS

1. INTRODUCTION

Vector has engaged Cambridge Economic Policy Associates (CEPA) to support it in relation to the New Zealand Electricity Price Review (EPR). The EPR Panel has released its first report, setting out an initial assessment of the electricity market.[1] Vector has asked CEPA to provide comment on the Panel's findings in relation to the liquidity of the forward contract market. This working note sets out our views on this topic and highlights potential areas for further analysis.

Overall, we note that the liquidity analysis presented by the Panel is limited, focussing on one indicator (buy-sell spreads) for one category of forward contracts. We suggest that the Panel's findings could be strengthened by considering additional indicators. We have considered one additional indicator (churn ratio), and compared this to available data on other markets. We have also compared the Panel's findings on buy-sell spreads to the data available for the forward electricity contract market in Great Britain (GB). Our analysis is limited, given the data and time restrictions for this note. Nonetheless, the indicators are consistent with a relatively low level of liquidity in the New Zealand forward market.

2. FORWARD CONTRACT MARKET LIQUIDITY

The Panel has undertaken a brief assessment of liquidity in the forward contract market, presenting analysis on the spread between contract buy and sell prices. This data relates to the average buy-sell price spread at the end of each trading day for the nearest three-monthly futures contract on the ASX, for the Benmore grid reference point.[2] The Panel notes that while buy-sell spreads have generally fallen within the 5% target since the voluntary market maker agreements were introduced, in the winter of 2017 spreads frequently exceeded this threshold. Noting the importance of a liquid contract market for non-vertically integrated retailers to compete effectively, the Panel considers that *"improving the depth and resilience of the contract market should be given high priority"*[3].

While we are generally in agreement with the analysis presented by the Panel, we note that it provides only a limited picture of liquidity in the forward contract market. We suggest that the Panel's conclusions could be further supported by consideration of:

- Additional indicators of liquidity, noting that there is not one agreed measure relied upon by regulators and competition authorities elsewhere.
- A comparison of liquidity in the New Zealand forward contract market to other markets.
- A broader range of forward contracts in the New Zealand market.

We expand on the first two points below. At this time, we have not been able to process the available data on a broader range of forward contracts in New Zealand, but note that this could be an area for further analysis.

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[1] *Electricity Price Review – First report for discussion*, 30 August 2018.

[2] The EPR report does not state whether this relates to baseload contracts only, or whether peak contracts are also included.

[3] Ibid., page 45.

2.1. INDICATORS OF LIQUIDITY

Regulators and competition authorities in other jurisdictions typically define liquidity as the extent to which a market participant can (within the timeframe required) buy or sell a desired volume of energy without materially affecting the market price and without incurring substantial transaction costs.[4] Generally, liquidity is assessed with regard to a range of alternative proxy indicators rather than a single measure or metric. These may include:

- **Buy-sell spreads** – Defined as the amount by which the ask price exceeds the bid price; in other words, the difference between the highest price that a buyer is willing to pay and the lowest price for which a seller is willing to sell. Wider spreads tend to discourage trading due to higher transaction costs, and therefore may indicate a less liquid market.
- **Churn rate** – The churn rate compares trading volumes against underlying physical electricity consumption. This provides an indication of how many times a unit of electricity is traded before delivery to the end consumer. Churn rates also allow for a comparison of liquidity between markets with different characteristics (for example, size or product).
- **Trading volumes** – Measures trading activity rather than liquidity *per se*, but may provide an indication of liquidity based on how frequently trades for particular products occur (may be useful to compare across product types). The extent of trading along the forward curve may also be a useful indicator, as the further forward products are available, the further out market participants are able to hedge their position.
- **Market depth** – Estimates the size of a sale needed to move the market price by a certain level. This captures the ability of traders to buy and sell at the current market price.
- **Product range** – Assessing the available range of products may be useful, as this impacts the extent to which market participants are able to accurately shape their contract portfolio to expected demand.
- **Number of participants** – A relatively high number of active participants can be an indication of confidence in the market, which can help support the development of liquidity. A breakdown of the type of market participants may also assist to build up a picture of liquidity. For example, traders without a physical position may generally be expected to trade only in competitive/active markets.

2.2. INDICATIVE COMPARISON TO OTHER JURISDICTIONS

The range of metrics considered by regulators in other jurisdictions suggests that a fuller picture of contract market liquidity in New Zealand could be obtained by extending the Panel's analysis beyond buy-sell spreads. As there is not a generally agreed 'optimal level' for the liquidity indicators noted above, a benchmarking exercise would also assist the Panel in understanding the relative performance of the New Zealand market compared to other markets and jurisdictions. Given the time and data limitations for this note, we have not undertaken a comprehensive analysis of these indicators. However, in this section we highlight publicly available data for churn and buy-sell spreads, for the NZEM and a selection of comparator forward electricity markets.

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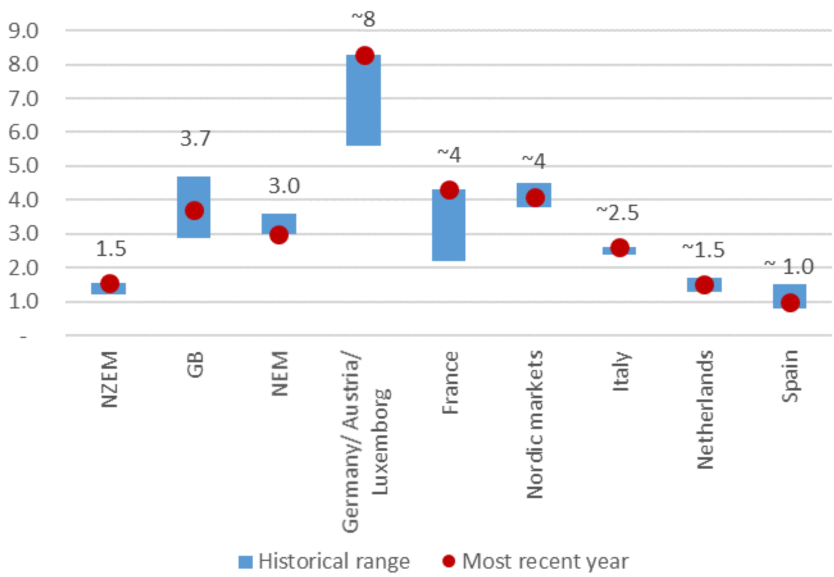
[4] See for example ENTSO-E (2018), Ofgem (2009), ACCC (2018).

Churn

As indicated in the figure below, a high-level comparison of the churn ratio for the NZEM forward contract market indicates that it has been generally well below that of Great Britain and the Australian National Electricity Market (NEM), as well as a number of European forward electricity markets.

Figure 1: Indicative churn rate comparison



Notes and sources:

[1] Churn is defined as total traded energy volume divided by total energy consumption.

[2] The churn ratios above cover the following time periods: NZEM 2014-2017 (calendar years); GB 2010-2017 (calendar years); NEM 2012/13 – 2014/15 (financial years); other jurisdictions 2014-2016 (calendar years).

[3] CEPA has calculated indicative churn ratios for the NZEM based on the following data. NZEM trading volume data is sourced from the Energy Hedge Disclosure System database - EHDS (2018). Trading volumes are grouped by delivery period (i.e., a trade made in 2016 for delivery in 2017 is included in the 2017 total). Physical consumption data is sourced from MBIE (2017). We note that there are some limitations to the EHDS data that may require further investigation. In particular, it is possible that some ASX trades are included twice (i.e., both the buy and sell side are recorded), which would tend to overstate the ratio.

[4] Churn ratios in other jurisdictions are as reported by the following sources: GB – Ofgem (2018); NEM - AFMA (2015); EU jurisdictions ACER (2017). As described in these sources, the calculation of the churn ratio appears in line with our analysis of churn in the NZEM. However, we have not replicated these calculations and there may be some methodological differences.

While there is no 'consensus' level for a churn ratio that indicates a satisfactory level of market liquidity, commentators in other jurisdictions have expressed the view that a desirable level lies above 3. For example, Ofgem's 2009 review of the GB electricity market (prior to the introduction of measures to support liquidity), viewed the then current churn ratio of 3 as relatively low (as compared to the GB gas market and a range of European comparators).[5] Previous analysis undertaken / commissioned by the Agency for Cooperation of Energy Regulators (ACER) in Europe suggests 3 as a minimum level, and ACER has described liquidity for the Italian, Dutch and Spanish forward markets shown above as 'limited'.[6]

[5] Ofgem (2009).

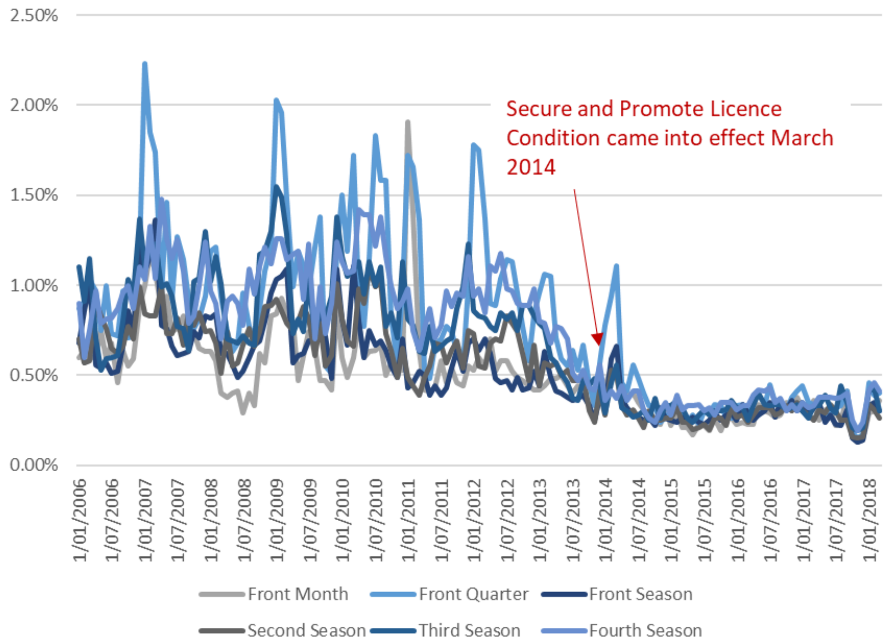
[6] ECA (2015), ACER (2017).

Establishing an appropriate level for New Zealand is beyond the scope of this brief paper, but we note that evidence from other jurisdictions suggests that the current churn ratio can be considered relatively low.

Buy-sell spreads

A comparison to the buy-sell spreads for a range of forward baseload contracts (from one month to 24 months ahead) in the GB electricity market is shown in the figures below. The Secure and Promote Licence Condition (in effect from March 2014) introduced maximum buy-sell spreads ranging from 0.5% to 1.0%, depending on the forward product.[7] As illustrated in Figure 2, spreads narrowed significantly after the introduction of these provisions.

Figure 2: Great Britain - Buy-sell spread for a range of OTC baseload products



Source: Ofgem (2018).

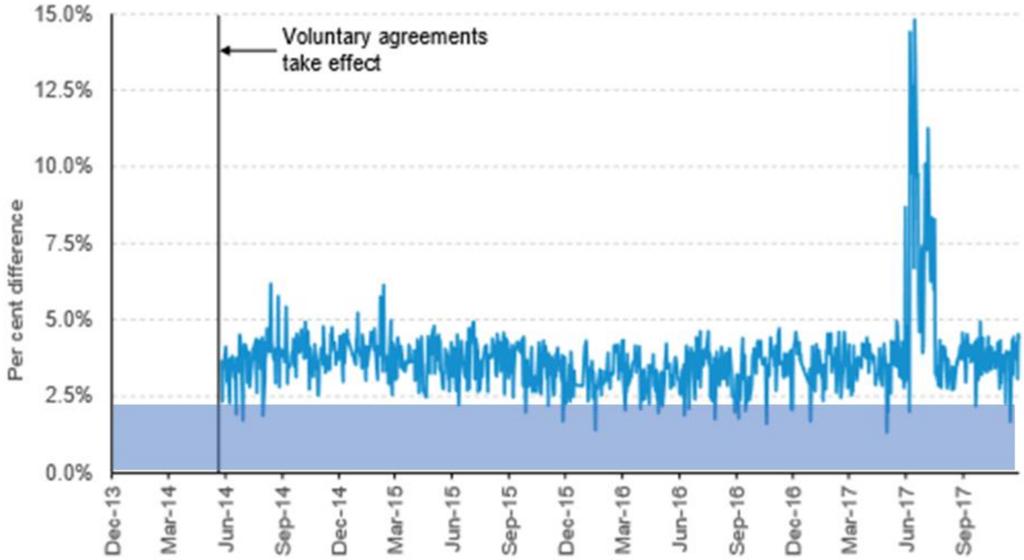
Notes: Figures are presented as monthly averages of daily spreads.

However, as illustrated in Figure 3, even prior to the introduction of these measures, spreads were generally well below the level observed in New Zealand since the voluntary market maker obligations were introduced. From January 2006 to March 2018, buy-sell spreads in GB have ranged between a minimum of 0.13% and maximum of 2.23%. This suggests that the current maximum spread for New Zealand may be relatively high. We note that previous analysis undertaken by the Wholesale Advisory Group (WAG) convened by the Electricity Authority recommended that the Authority pursue a maximum target buy-sell spread of 3.0% for ASX baseload futures.[8]

[7] The Secure and Promote Licence Condition was introduced to improve liquidity in the GB wholesale electricity market. This measure imposed a Market Maker Obligation (MMO) on the 'Big Six' major energy suppliers. Ofgem is currently reviewing the provisions of the MMO (due to complete in 2019) and is considering whether to suspend the MMO while the review is underway.

[8] WAG (2015)

Figure 3: Comparison of New Zealand buy-sell spread and the GB maximum/minimum buy-sell spread over January 2006-March 2018 (blue bar).



Source: EPR (2018), Ofgem (2018).

Notes: The GB data is for baseload contracts. As noted above, it is not clear whether the NZ data is for baseload only. We would tend to expect spreads for peak contracts to be higher than for baseload contracts.

As noted above, there is no single indicator of whether forward market liquidity is adequate. We also note that comparisons between different jurisdictions need to take the different context of each market into account. For example, as noted by ACER, larger trading zones will typically enjoy a higher degree of liquid trading; given the size of the New Zealand market, it may not be realistic to expect that liquidity could reach the levels indicated for some of the European comparators shown above. Further, liquidity should be assessed in the context of market participant requirements. For example, New Zealand has a relatively high level of vertical integration, which may mean that demand for forward contracts is more limited relative to the other markets presented above; the key question is whether forward contract liquidity is sufficient to support market entry by non-vertically integrated competitors. The relatively simplistic analysis that we present above should be interpreted in the context of these limitations.

2.3. Further analysis

While the data above does not provide a complete picture of hedge contract market liquidity in New Zealand, we consider that this supports the Panel's analysis.

Additional analysis could be undertaken to present a more comprehensive picture on liquidity. In particular, the comparison for buy-sell spreads could be extended. We note that the analysis presented by the Commission for New Zealand considers spreads for only the nearest three-monthly contract available at Benmore. A more comprehensive assessment of the ability of retailers to hedge their wholesale market exposure could consider bid-ask spreads for contracts further along the forward curve, at the Otahuhu grid reference point and for peak and baseload contracts. We note that the raw data required to calculate buy-sell spreads for a wider range of products in the Australian NEM and the NZEM is available, but we have not been able to fully process and analyse this data for this note. Nonetheless, it is available to inform further analysis by the Panel.

Other potential areas for further investigation include:

- Gathering and analysing data for the other liquidity indicators noted above. Regulators in other jurisdictions (for example, Ofgem, ACER, ACCC) appear to have placed greater weight on analysis of churn / buy-sell spreads. However, the other indicators may be useful to provide context for the core metrics and further supporting evidence.

- A more detailed comparison of the different liquidity metric values observed between New Zealand and other markets. This analysis would assist to identify reasons for the observed variations in the extent of forward trading, which may include: interconnection; physical characteristics (e.g., market size); generation mix;[9] business models and hedging requirements of market participants; and measures adopted to promote liquidity. Consideration of these factors would help to build up a more meaningful comparison between the NZEM and other jurisdictions.

- Analysis of measures to enhance liquidity that have been adopted in other markets, and an assessment of relevant lessons for New Zealand. This analysis would assist to:
    - Understand how other jurisdictions determined the demand for forward liquidity and an adequate target level.
    - Identify the types of approaches that have been adopted to support or further develop liquidity, and to assess evidence of their success or failure.
    - Assess to what extent the identified measures could be appropriate in the New Zealand context, should the Panel determine that measures beyond the EA's ongoing initiatives are required.

  Relevant case studies could include:
    - England and Wales. Ofgem's Secure and Promote licence condition (Ofgem is conducting an ongoing review of this measure).
    - Ireland (Republic of Ireland and Northern Ireland). We also note that the regulatory authorities (RAs) for the Irish Integrated Single Electricity Market (I-SEM) have recently reviewed measures to promote forward liquidity in that market. While the RAs decided against introducing market maker or forward contracting obligations at this time,[10] they announced plans to engage with industry to reduce transaction costs for smaller market participants (e.g., credit arrangements) and improve the mix of forward products offered.[11]
    - Nordic countries. While not a forward market, the arrangements in the Nordic intraday market could also provide examples of incentives to encourage voluntary market marking.

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[9] For example, higher penetration of intermittent generation may place some structural limits on liquidity, as generators with variable output may have a reduced ability to sell forward.

[10] Beyond the existing Directed Contracts obligation placed on dominant generator ESB as a market power mitigation measure.

[11] SEM Committee (2016).

APPENDIX A REFERENCES

ACCC (2018), 'Australian Competition and Consumer Commission', *Retail Electricity Pricing Inquiry – Final Report*, June 2018.

ACER (2017), 'Agency for Cooperation of Energy Regulators', *Annual Report on the Results of Monitoring the Internal Electricity and Gas Markets in 2016*, October 2017.

AEMC (2018), 'Australian Energy Market Commission', *Biennial Review into Liquidity in Wholesale Gas and Pipeline Trading Markets – Final Report*, June 2018.

AFMA (2015), 'Australian Financial Markets Authority', *2015 Australian Financial Markets Report*, 2015.

CEPA (2015), *Implementation monitoring and evaluation of the impact of the gas network codes and guidelines on the internal market*, report for ACER, October 2015.

ECA (2015), 'Economic Consulting Associates', *European Electricity Forward Markets and Hedging Products – State of Play and Elements for Monitoring*, September 2015.

ENTSO-E (2018), 'European Network of Transmission System Operators for Electricity', *First Edition of the Bidding Zone Review – Final Report*, 2018.

MBIE (2017), 'Ministry of Business, Innovation and Employment', *Energy statistics – electricity*, website: https://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/statistics/electricity last accessed 16 October 2018.

NZEM Energy Hedge Disclosure System (2018), website: https://www.electricitycontract.co.nz/, last accessed 16 October 2018.

Ofgem (2009), *Liquidity in the GB wholesale energy markets – Discussion Paper*, June 2009.

Ofgem (2018), *Wholesale Market Indicators*, website: https://www.ofgem.gov.uk/data-portal/wholesale-market-indicators last accessed 16 October 2018.

SEM Committee (2016), *Measures to promote liquidity in the I-SEM forward market – Decision Paper*, March 2016.

WAG (2015), 'Wholesale Advisory Group', *Hedge Market Development - Recommendations Paper*, June 2015.

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Economic review of electricity generation and retail market issues

A report for Vector

October 2018

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Contents

List of appendices

Executive summary

This report has been prepared by Axiom Economics on behalf of Vector. Its purpose is to provide an independent economic review of certain aspects of the first report into the state of the electricity sector ('the First Report') released by the Ministry of Business, Innovation and Employment's expert advisory panel ('the Panel').[1] Specifically, we have been asked to focus on the Panel's analysis and conclusions in relation to the wholesale and retail sectors, which are dispersed throughout Parts 3 and 4 of the First Report.

Background

Over the last decade, various attempts have been made to examine the state of competition in both the electricity retail and wholesale sectors, including whether market power is present and being exercised. For example, the 2009 Ministerial Inquiry[2] panel (the '2009 Panel') examined a retail margin analysis that had been undertaken by the then Electricity Commission (EC) in 2008. That analysis indicated, amongst other things, that:[3]

- at a national level, average margins[4] for incumbent New Zealand retailers were significantly higher than for their Australian counterparts and exceeded significantly those being earned by newer entrants;[5] and
- the regional data were even more troubling, with only a few network areas found to have margins below 8% (the higher of the levels observed in Australia) and many regions had margins above 12%.

The 2009 Panel concluded that, even allowing for a degree of estimation uncertainty, margins at these levels raised significant concerns about whether competition was acting as an effective restraint on prices.[6] Since that time and the publication of the First Report, no serious attempts were made to examine more closely the trends the 2009 Panel found so disconcerting. Instead, studies have focused on less significant factors, such as movements in retail market shares.[7]

1 Electricity Price Review, *First Report for Discussion*, 30 August 2018 (hereafter: 'First Report').

2 *Improving Electricity Market Performance Volume two: Appendices,* A preliminary report to the Ministerial Review of Electricity Market Performance by the Electricity Technical Advisory Group and the Ministry of Economic Development August 2009 (see here). (hereafter: 'Ministerial Inquiry Report Volume 2').

3 Ministerial Inquiry Report Volume 2, p.106.

4 The margin referred to here is a net retail margins, i.e., retail earnings before interest and tax, expressed as a percentage of the total bill. *See:* Ministerial Inquiry Report Volume 2, p.104.

5 Ministerial Inquiry Report Volume 2, p.105.

6 Ministerial Inquiry Report Volume 2, p.106.

7 For example, from 2011 to 2015, the Electricity Authority (EA) prepared an annual 'market performance assessment' (the five editions of which are available here). Despite the 2009 Panel's adverse findings with respect to retail margins, these annual assessments did not re-examine the matter. Instead, the EA's analyses of retail markets focused on metrics such as market shares, switching rates and energy price components.

The 2009 Panel also performed an analysis which indicated that, on a nationwide basis, wholesale contract prices had, at times, exceeded the estimated cost of new entry for extended periods (12- to 24 months at a time). That was arguably problematic in and of itself – and not a sound basis to be confident that competition was effective. Indeed, had the analysis been undertaken on average spot prices (rather than contract prices) and/or for narrower geographic areas (such as for nodes prone to pivotal supplier situations) it is possible that very different relationships might have emerged.

In the ensuing years, several more comprehensive studies have been undertaken of the wholesale market, using sophisticated modelling of prices and costs. Many have addressed the perceived shortcomings of the high-profile study of the sector undertaken by Professor Frank Wolak for the Commerce Commission (Commission) in 2009,[8] including its failure to account properly for the opportunity cost of water. For example, the analyses of Browne *et al* (2012),[9] Philpott and Guan (2013)[10] and Poletti (2018)[11] all explicitly incorporate water values, and each detected several billion dollars' worth of market power rents.

Consequently, as at 2009, it is reasonable to state that significant uncertainty surrounded the effectiveness of competition in both the retail and wholesale sectors. And subsequent analyses of the wholesale market coupled with the well-documented trends in retail prices suggest that, when the Panel commenced its current review, it had even more cause to be concerned about potential problems in these markets than its predecessor.

Assessment of the generation market

The Panel's examination of the generation market is quite limited. By way of comparison, the Australian Competition and Consumer Commission's (ACCC's) electricity market inquiry report[12] contained more than 70 pages of in-depth analysis of the Australian wholesale market.[13] In many cases, this is attributably largely to the lack of data available to the Panel.[14] Nevertheless, the upshot is that the potential

8 See: *An assessment of market power in the New Zealand wholesale electricity market*; Frank A. Wolak; Stanford University; 2009, Report prepared for the New Zealand Commerce Commission (available: here).

9 Browne *et al* (2012), 'Simulating market powering in the NZ electricity market', *N.Z.Econ.Pap.46 (1)*, pp.35–50 (available: here) (hereafter: 'Browne *et al*' (2012)').

10 Philpott, A., & Guan, Z. (2013). *Models for estimating the performance of electricity markets with hydro-electric reservoir storage. Technical report*, Electric Power Optimization Centre, University of Auckland (available: here).

11 Poletti, S., (2018). *Market power in the New Zealand wholesale market 2010-2016,* University of Auckland (available: here) (hereafter: 'Poletti (2018)').

12 ACCC, *Restoring electricity affordability & Australia's competitive advantage, Retail Electricity Pricing Inquiry: Final Report,* 11 July 2018, p.59. (hereafter: 'ACCC Final Report').

13 That is the same length as the Panel's entire report, i.e., setting aside the overview and appendices, the First Report is 71 pages.

14 Indeed, the ACCC was able to avail itself of mandatory information gathering powers to obtain material that the Panel will only receive if industry participants provide it voluntarily.

problems highlighted in the various studies undertaken since 2009 have not, in our view, been examined sufficiently. For example:

- neither the net cash flow analysis nor the comparison of contract prices and new build costs establishes that prices and margins are consistent with workable competition, i.e., they cannot be used to rule out market power rents;
- the Panel acknowledges the potential for the exercise of transitory pricing power, and the EA's interpretation and application of the undesirable trading situation (UTS) provisions could serve to exacerbate these problems; and
- the Panel highlights – quite rightly – the importance of hedging instruments in enabling non-vertically integrated generators to compete, but arguably understates the potential shortcomings in the existing price signals.

More work therefore needs to be done before the Panel could conclude reasonably that competition in the wholesale market is workable. Of course, the Panel's ability to undertake those types of analyses will depend to a large degree on the data provided to it by the businesses. Ideally, the Panel would be privy to enough information to enable it to explore crucial matters such as:

- the relationship between average spot prices and either new generation costs or long-run marginal costs (see Appendix A) in more granular geographic locations over time;
- whether generators' margins differ significantly between vertically integrated businesses and those without natural hedges (i.e., without their own retail loads) and/or across geographies – and how those profits have moved over time;
- the number of trading periods in which spot prices exceeded, say, $300/MWh at any node across the country over time;[15,16] and
- offers and average output by technology[17] and the identity of marginal generators in each region over time by location, generator and fuel type.[18,19]

If adequate data are *not* provided to enable the Panel to undertake these types of analyses, it will undermine substantially the review. Irrespective of whether those data are provided, it may be worth considering imposing additional information disclosure requirements on generators and retailers, compelling them to report bespoke margins for their retail and generation operations in a standardised way. This information might be published, or it could simply be provided to the Commission on a periodic basis for monitoring purposes.[20]

15 ACCC Final Report, p.59.

16 Note that this information is not easily obtainable from the Electricity Market Information (EMI) dataset – it would require significant work to extract.

17 *See for example:* ACCC Final Report, pp.56-57.

18 *See for example:* ACCC Final Report, pp.60-65.

19 again, these data are not readily obtainable from the EMI data service.

20 To that end, we note that the ACCC has recently been given an analogous monitoring role in Australia, whereby it will report periodically on prices and profits throughout the electricity supply chain (see: here).

Assessment of the retail market

The Panel has identified several potentially significant problems in the retail market. First and foremost, it rightly highlights the 'two-tier' market structure and the potential adverse effects this can have for both efficiency and equity. The two-tier dynamic may provide opportunities for established retailers to earn excessive profits from their disengaged customer bases – a group in which vulnerable consumers are likely to be overrepresented. This is consistent with the retail margin analysis performed by the EC in 2008, which indicated that incumbent retailers' profits were very high. Other potential problems include:

- the seemingly low levels of liquidity in the hedging market noted above – the resulting problems apply equally to retailers and generators, and may raise barriers to entry and expansion in both markets;
- the design and application of conditional discounts, which will almost inevitably result in passive, vulnerable customers being penalised disproportionately for costs that retailers are not, in fact, incurring; and
- the unexplained upward trajectory of retail costs, a trend that does not comport with what one might typically expect to observe in a market if competition is working effectively.

This suggests there is enough basis for the Panel to consider policy interventions targeted at improving retail market outcomes. The least interventionist approach would be to seek to improve the awareness amongst disengaged customers of the options available to them and the magnitude of the potential savings on offer. While potentially worthwhile, the main problem with such initiatives is that they may have only a small effect on any underlying problem. Recent experience in both the United Kingdom (UK) and Australia suggests that these strategies have had only a very limited impact on the level of customer engagement in each location.

Another lighter-handed initiative would be to limit the size of conditional discounts – especially prompt payment discounts – to the size of the potential savings. Such a step would ensure that disengaged and/or vulnerable customers are not being penalised disproportionately for costs that retailers are not, in fact, incurring when those conditions are not met (e.g., when payments are late). The ACCC has recommended precisely this intervention in Australia.

A further option would be to run 'auctions' for disengaged customers to offer other retailers the opportunity to serve them. Although this would clearly constitute a significant intervention it would be 'market-based'. If designed well, the process could enable disengaged consumers to benefit from competition without incurring the costs of searching and switching whilst, ideally, limiting any unintended consequences. It would consequently be less 'heavy-handed' than, say, introducing regulated retail price caps. The effectiveness and practicality of the initiative could also be tested by running small-scale pilots.

1. Introduction

This report has been prepared by Axiom Economics on behalf of Vector. Its purpose is to provide an independent economic review of certain aspects of the first report into the state of the electricity sector (the First Report) released by the Ministry of Business, Innovation and Employment's expert advisory panel (the Panel).[21] Specifically, we have been asked to focus on the Panel's analysis and conclusions in relation to the wholesale and retail sectors, which are dispersed throughout Parts 3 and 4 of the First Report.

The remainder of this report is structured as follows:

- in **section two** we provide some background on the various attempts that have been made to examine the state of competition in both the electricity retail and wholesale sectors, and explain why the Panel had cause to be concerned about both when it commenced its review;
- in **section three** we examine the Panel's assessment of the generation market and explain why it does not contain the types of analyses required to reach reliable conclusions about the state of competition – we then suggest some potential areas for further work; and
- in **section four** we review (and largely concur with) the various problems that the Panel identifies in the retail market, including its 'two-tier' structure – we then describe some potential policy initiatives for addressing those issues that the Panel may wish to consider.

We have also included additional material in two more detailed appendices. **Appendix A** contains an explanation of the relationship between short-run marginal cost (SRMC), long-run marginal cost (LRMC) and new investment in workably competitive energy-only generation markets. And **Appendix B** provides a more detailed account of two potential ways in which disengaged customers might be 'auctioned' to competing retailers, based on precedents from the UK and the Electricity Authority (EA).

21 Electricity Price Review, *First Report for Discussion*, 30 August 2018 (hereafter: 'First Report').

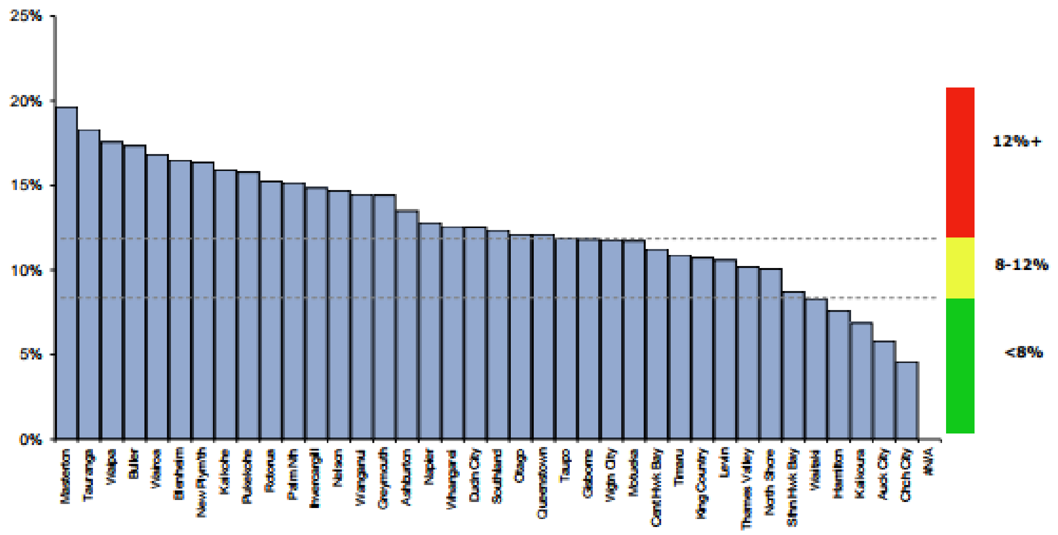
2. Background

Over the last decade, various attempts have been made to examine the state of competition in both the electricity retail and wholesale sectors, including whether market power is present and being exercised. We recap those studies below, including the potential problems that have been identified in each market. We then set out what we consider to be the key implications for the Panel's current work.

2.1 Findings of the 2009 Panel

A logical place to start is the work of the Panel's predecessor – the 2009 Ministerial Inquiry Panel[22] (the '2009 Panel'). The 2009 Panel examined a retail margin analysis that had been undertaken by the then Electricity Commission (EC) in 2008. That analysis indicated that, at a national level, average margins[23] for incumbent New Zealand retailers were significantly higher than for their Australian counterparts and exceeded significantly those being earned by newer entrants.[24] The regional data were even more troubling. Only a few network areas were found to have margins below 8% (the higher of the levels observed in Australia) and many regions had margins above 12%, as Figure 2.1 illustrates.

Figure 2.1: Estimated margins for incumbent retailers by network



Source: Ministerial Inquiry Report Volume 2, p.106 (see: here); Electricity Commission analysis.

Seeing margins at these levels unsurprisingly prompted questions about whether retail competition was functioning effectively. The 2009 Panel noted that it was

22 *Improving Electricity Market Performance Volume two: Appendices,* A preliminary report to the Ministerial Review of Electricity Market Performance by the Electricity Technical Advisory Group and the Ministry of Economic Development August 2009 (see here). Hereafter: 'Ministerial Inquiry Report Volume 2'.

23 The margin referred to here is a net retail margins, i.e., retail earnings before interest and tax, expressed as a percentage of the total bill. *See:* Ministerial Inquiry Report Volume 2, p.104.

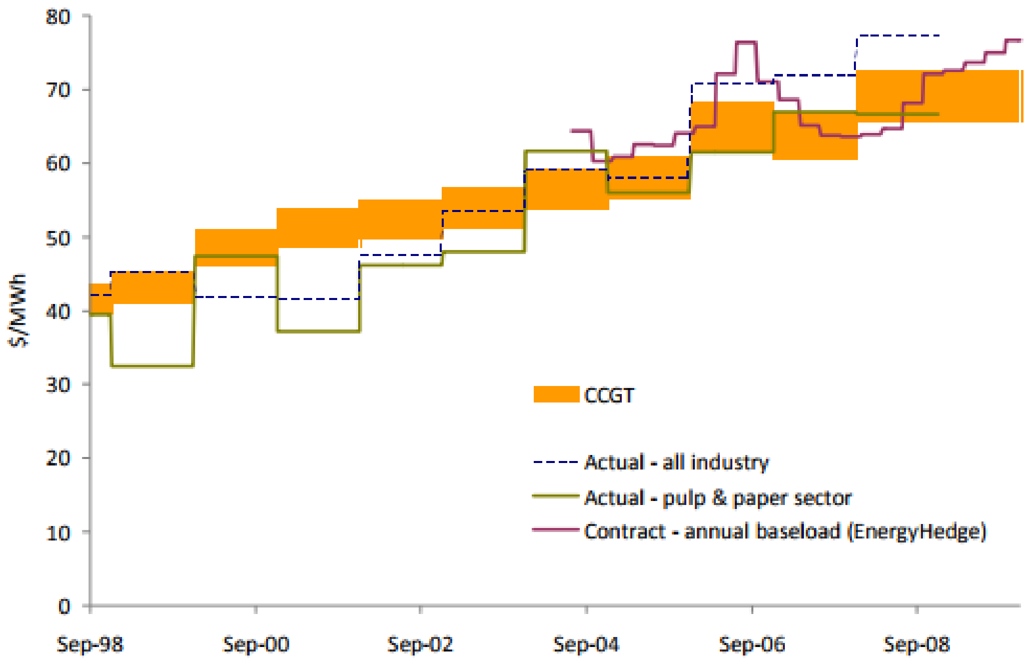
24 Ministerial Inquiry Report Volume 2, p.105.

possible that the wide regional variations in margins could stem from cost differences – but it ultimately dismissed that potential explanation as unlikely. It also observed that, if that had indeed been the key driver, it raised the issue of whether competitive pressures in the retail sector were strong enough to drive efficiency improvements. Overall, the 2009 Panel concluded that:[25]

> *'Even allowing for a degree of estimation uncertainty, margins at these levels raise significant concerns about whether competition is acting as an effective restraint on prices.'*

The examination of wholesale margins also provided relatively little solace. The 2009 Panel compared nationwide estimates of the cost of new entry to prevailing contract prices. The rationale presumably being that, in a workably competitive market, one would not expect to see prices exceed the cost of building new plant for prolonged periods, since this should prompt entry and expansion, driving profits back down to so-called 'normal' economic levels. Figure 2.2 illustrates what the 2009 Panel found.

Figure 2.2: Contract prices vs. cost of new generation



Source: Ministerial Inquiry Report Volume 2, p.94 (see: here).

The 2009 Panel concluded that contract price indicators and estimated new build costs had followed a broadly similar track through time, but that there had been periods when prices had risen above (and fallen below) entry costs for 12- to 24-months.[26] On that basis, it concluded that there was not clear evidence of 'persistent overshooting' or of market power problems in the wholesale sector. However, in our opinion, there were at least two potential limitations with the Inquiry panel's empirical assessment.

25 Ministerial Inquiry Report Volume 2, p.106.

26 Ministerial Inquiry Report Volume 2, p.94.

First, the analysis was at a relatively 'high level' – i.e., nationwide – and on contract prices. The picture might have been quite different if the exercise had been undertaken on, say, average spot prices, which might be affected more acutely by the exercise of short-term pricing power (e.g., periods where nodal prices might exceed, say, $1,000/MWh). Instead, the 2009 Panel implicitly assumed equivalence between contract prices and spot prices.

On its face, that assumption was not unreasonable. In theory, contract prices should reflect forward-looking expectations of average future spot prices, i.e., there should be a symbiosis between the two.[27] However, it is not obvious whether that relationship would be 'ironclad' if the wholesale market exhibited, say, large unpredictable price spikes. For example, if such spikes had been larger – or occurred with greater frequency – than anticipated or, alternatively, if they could not easily be factored into forward-looking assessments, then contract prices could have been *below* average spot prices, changing the picture presented in Figure 2.2.

The outcome might also have changed if the assessment had been undertaken for more granular geographies. The analysis assumed implicitly that the relevant market was nationwide, i.e., that there is a single national generation market. However, in our view, it is at least plausible that the North and South Islands might constitute separate economic markets, i.e., that a 'hypothetical monopolist' in the South Island would find it profitable to impose a 'small but significant non-transitory increase in price'.[28] There might also have been certain nodes prone to 'pivotal supplier situations' (a scenario we explore in more detail subsequently) that may have been worthy of specific attention.

Second, even the nationwide data raised some questions. For example, it is not immediately clear that 12 to 24-months is a reasonable period for prices to have exceeded the cost of new entry in an ostensibly competitive wholesale market, given its underlying economics characteristics. When new generation capacity is added – particularly base-load or mid-merit capacity – it is typically in large 'lumps', i.e., a big new thermal plant or a new wind farm. This has potentially important implications for the relationship between prices and the cost of new entry that one might expect to observe if competition is effective.

27 Specifically, the price of hedge contracts is determined primarily by the balance of expectations as to the level and volatility of future wholesale spot price outcomes. If this were not the case – and the price of hedges was out of line with expectations of future spot prices – then profitable arbitrage opportunities would arise to close the gap.

28 The process of defining the boundaries of an antitrust market involves establishing the smallest area of product, functional and geographic space within which a hypothetical profit maximising monopolist could successfully impose a small but significant and non-transitory increase in price (a 'SSNIP'), usually of 5-10%. A SSNIP is only feasible when all current and potential sources of close substitutes for the firm's products have been included in the definition of the market. If, following an attempted SSNIP, consumers would be expected to switch their demand to close substitutes and/or alternative suppliers would enter the market and serve large volumes of the hypothetical monopolist's sales, the exercise would not prove profitable. In that circumstance, the definition of the relevant market would need to be expanded to encompass those services of either the demand-side or supply-side substitute. The exercise is repeated until a SSNIP *is* profitable, thereby suggesting that all relevant substitutes have been encapsulated.

Specifically, when new generation is added to the market (or, at least, new base-load or mid-merit plant), this should reduce the SRMC of supplying wholesale electricity from prevailing levels, which should then be reflected in average spot and, in turn, contract prices.[29] Moreover, if that new generation results in there being ample capacity (albeit in the substantial majority of trading periods) for an extended window, the ongoing SRMC of supply should remain at relatively low levels for a sustained period. Specifically, SRMC – and spot prices – should arguably then be below the cost of new entry for a significant window following a lumpy new generation investment.

Then, if the supply/demand balance tightens (e.g., if demand grows over time) and periods of scarcity become more common, the SRMC of supply might start to rise. In time, the SRMC of meeting (and curtailing) demand with the existing generation fleet should grow to be equal to or more than the cost of building new plant. At that point, in a competitive market, one would expect more new generation investment to occur. One might therefore expect that new 'lump' of investment to result in the SRMC again dropping back below the cost of building new plant for another extended period. But that is arguably not what Figure 2.2 shows.

For example, from 2002 to 2008, the wholesale contract price was comparable to – and often above for prolonged periods – the estimated cost of building new plant. For the reasons set out above, we are not as confident as the 2009 Panel that this is necessarily symptomatic of effective wholesale market competition. In our opinion, one could observe the relationship seen in Figure 2.2 and there might still be a market power problem. Indeed, as we explain below, several more comprehensive studies of the wholesale market undertaken since that time have estimated *substantial* market power rents.

2.2 Subsequent analyses of the retail market

Between 2009 and the publication of the First Report there was no serious attempt to 'drill-down' further into the retail margin analyses that the 2009 Panel found so disconcerting. From 2011 to 2015, the EA did prepare an annual 'market performance assessment'.[30] However, despite the 2009 Panel's adverse findings with respect to retail margins, these annual assessments did not re-examine the matter. Instead, they focused on issues of less significance, including, for example:

- Movements in market share indices such as concentration ratios and the Herfindahl Hirschman index (HHI). The EA observed that the market shares of incumbent retailers were falling, while new entrants' shares were growing. However, there were several limitations with the EA's metrics, as well as with retail market share statistics as an explanatory tool more generally; namely:

[29] See Appendix A. For an even more detailed account of the relationship between short- and long-run marginal costs in electricity wholesale markets, *see:* Green et al, *Potential Generator Market Power in the NEM*, A Report for the AEMC, 22 June 2011 (available: here).

[30] The five editions of this assessment are available: here.

- The concentration ratios and HHIs were based on each retailer's share of total 'installation control points' ('ICPs'), i.e., customer numbers. Quite a different picture might have emerged had market shares been reported based on, say, shares of total retail revenue. If a new entrant had won, say, 5% of ICPs, but they were primarily 'low value' customers, its revenue share might have been much smaller, e.g., 1%.[31]
- The indices reflected nationwide market shares. Completely different patterns might have emerged if the shares had been measured on a regional basis. Indeed, the EC's analysis in 2008 revealed that retail margins were estimated as exceeding 12% in some network areas, suggesting that any problems might manifest only in certain geographic pockets.
- More fundamentally, any measures of market share – and movements thereof – are insufficient in themselves to establish whether a market is characterised by effective competition. Market power problems can still arise even at moderate levels of concentration, which is why competition agencies typically place limited weight on this factor when adjudicating upon mergers and acquisitions.[32]

▪ Switching rates, which measure the proportion of customers that change electricity retailers in a year. The EA noted that switching rates were relatively high by international standards. However, like market shares, switching rates do not reveal all that much about the state of competition in a market in isolation. For example, if the rate of switching increases from, say, 15% to 40%, is that a good or a bad thing? Could it simply reveal that more customers are dissatisfied with their retailers? Moreover, there are potentially more important matters to consider than the bare switching statistics themselves, such as:

- When are customers switching and why, e.g., what proportion of customers switch at the end of their contracts as opposed to 'mid-term' and how many churn simply because they have moved house, and so on?
- What type of customers are switching, e.g., is it only a sub-set of customers – say, low-value customers – that are actively engaging, leaving a relatively disengaged base of high-value customers for incumbent retailers to 'milk', so to speak, creating a 'two-tier' market dynamic (a point we return to later)?

▪ Movements in the energy price components (i.e., excluding the distribution and transmission network costs) of final retail tariffs. Namely, the EA found that, from 2011 to 2015, these components increased more slowly than retailers' costs. It therefore concluded that competitive pressure had limited retailers' ability to

[31] To use an example from another industry: Ferrari has considerably fewer worldwide customers than say, Toyota, i.e., its global share of 'customers' is very low. However, your average Ferrari customer spends substantially more on a car than your typical Toyota customer, e.g., a Ferrari 458 might retail for NZ$500,000, whereas a Toyota Corolla might sell for, say, NZ$25,000, i.e., 5% of that sum. As such, Ferrari's share of global total sales revenue would be considerably greater than its annual share of customer numbers.

[32] See for example the Commerce Commission's merger and acquisition guidelines: Commerce Commission, *Mergers and Acquisitions Guidelines*, July 2013, p.30 (available: here).

'pass-through' underlying cost increases to consumers. This analysis was flawed for two reasons:

- In workably competitive markets, increases in input costs should be *fully* passed-through to consumers[33] – it is usually only when competition is *less* than effective that cost pass-through is incomplete,[34] i.e., if the EA's analysis was correct, it is more likely to support the *opposite* conclusion to the one that it reached.
- It did not reveal whether the *absolute values* of those energy price components contained excessive profits, e.g., if there were excess profits embedded in the prices at the start of the time-series, and those prices then changed at a rate broadly commensurate with input cost movements, then they would have *continued* to surpass competitive levels through time.[35]

In short, although some of the matters examined by the EA in its analyses could, in some cases, have provided some useful insight into the state of retail competition, their overall explanatory power was rather limited. Importantly, the absence of any comprehensive assessment of retail profitability in the ensuing years meant that, when the current Panel was formed, there was no cause to discount the significant concerns that had been expressed by the 2009 Panel regarding the margins observed during the prior review.

2.3 Subsequent analyses of the wholesale market

Since 2009, more empirical analysis has been undertaken of the wholesale market than the retail market. The first source of analysis worth highlighting concerns the high-profile study of the wholesale market undertaken by Professor Frank Wolak for the Commerce Commission (Commission) in 2009.[36]

Professor Wolak compared wholesale spot market prices from 2001 to mid-2007 with his estimate of a 'competitive benchmark' price – which reflected primarily SRMC – and concluded that market power rents were present. That work pre-dated (and, in part, prompted) the 2009 Ministerial Inquiry. However, upon closer

33 Specifically, if competition is effective, prices should reflect the underlying costs of supply, including a reasonable, risk-adjusted return on capital. It follows that, in the absence of significant impediments to price changes, 100% of an input cost increase should be passed-through to retail prices to ensure normal returns (zero economic profits) over the longer-term.

34 For example, a monopolist's price will almost never reflect its underlying cost of supply. It will instead set its price based on the willingness of its customers to keep buying its product as it gets more expensive. Specifically, it will restrict output, raising its price *above* the cost of supply, thereby earning 'above-normal' returns (or positive economic profits), even in the long-run. This means that, when its input costs increase, it *cannot* fully pass-through those costs to final customers – because it has already been setting an 'above-cost' price. Mathematically speaking, in the strict case of 'pure monopoly' facing a linear demand curve, where the firm was previously charging the monopoly price, it will only be able to pass-through *half* of any input cost increase.

35 For example, if applied to a monopoly price, such an analysis would not reveal any problems.

36 See: *An assessment of market power in the New Zealand wholesale electricity market*; Frank A. Wolak; Stanford University; 2009, Report prepared for the New Zealand Commerce Commission (see: here).

scrutiny, several limitations were identified – including a failure to account properly for the opportunity cost of water, a key component of the costs of hydro generation.

Given the raft of adverse commentary that Professor Wolak's report attracted, it is perhaps unsurprising that the 2009 Panel decided ultimately to largely ignore its findings. However, since the release of that report and the immediate aftermath, others have revisited Professor Wolak's approach and sought to address the various criticisms. For example, Browne *et al* (2012) constructed a model that sought to overcome some of the limitations in that earlier work. Their analysis yielded results that were broadly consistent with Professor Wolak's, i.e., they detected 'market power rents'. Specifically, the authors concluded:

> *'Our analysis finds **substantial market power** in the New Zealand electricity market. Across the two years we analyse, we estimate total market rents at $2.6 billion …*
>
> *…in our view, it would be very difficult to accurately model prices in the New Zealand Electricity Market without allowing for some market power, even after accounting for the opportunity costs for water.'* [emphasis added]

The subsequent work of Philpott and Guan (2013)[37] reached a very similar conclusion. They used a stochastic programme to estimate counterfactual 'competitive benchmark' water values and reported market rents as well as productive inefficiency of actual dispatch compared to the hypothetical competitive level. For the year 2005, they calculated market power rents of $935.4 million – an estimate that resembled very closely the analogous figure calculated by Professor Wolak in his study ($950.7 million).

Most recently, Poletti (2018)[38] compared wholesale market outcomes with a competitive market benchmark,[39] factoring in water values and hydro dam water level data. He estimated market power rents of $6 billion in the seven years from 2010 to 2016. These rents are therefore similar or even higher, as a fraction of revenue, to those found by Professor Wolak. In summing up his results, Dr Poletti offered the following observations about the critiques that had been made of Professor Wolak's work and their relevance:[40]

> *'Many of the critiques of the Wolak report are in our view tenuous and are used to justify the prevailing market arrangements. In particular, no attempt is made to quantify the market impact of the critiques. Instead they are used to dismiss the Wolak findings in their entirety. Our methodology, which uses fitted water values and demands dynamic consistency in the lake levels over the course of the year for the benchmark and market power simulations, directly addresses the substantive critique of the report. In our view the other critiques are not substantial. Nonetheless they are mostly taken into account by our methodology, which*

37 Philpott, A., & Guan, Z. (2013). *Models for estimating the performance of electricity markets with hydro-electric reservoir storage. Technical report*, Electric Power Optimization Centre, University of Auckland (see: here) (hereafter: Poletti (2018)).

38 Poletti, S., (2018). *Market power in the New Zealand wholesale market 2010-2016,* University of Auckland (see: here) (hereafter: 'Poletti (2018)').

39 He also compared the competitive benchmark to the prices simulated by the computer agent-based firms trying to maximise profits. This approach yielded similar market power rents to the comparison with actual market outcomes.

40 Poletti (2018), p.43.

calculates market power as the difference between competitive and simulated prices, which nets out to a large extent any errors in marginal cost estimations.'

Another source of subsequent analyses of the wholesale market has been the EA's annual market performance assessments – of which five editions were released between 2010 and 2015. These publications included a series of analyses of generators' incentives and abilities to engage in unilateral strategic conduct. For instance, the EA sought to estimate the frequency with which generators found themselves 'net pivotal' in the market (i.e., in a position where projected demand could not be met without their generation capacity, enabling them to create 'artificial scarcity' and engineer price increases – of potentially considerable magnitudes).[41]

These assessments suggested that, from 2010 to 2015, there was only a small number of generators – usually Meridian and Genesis – that found themselves in positions to substantially 'ramp up' their wholesale bids if they were so inclined, safe in the knowledge that they would still be called upon to run. Moreover, this scenario occurred in only a small number of trading periods – around 1.5% of the total in 2015. However, as useful as this analysis was, it did not establish either that wholesale margins were reasonable, or that competition was effective. There are several reasons for this, including:

- The nature of wholesale electricity markets means that a generator only needs to find itself in a 'net pivotal' situation a few times to be able to increase its returns well above the cost of new entry through *unilateral* action (i.e., without also relying upon an accommodating/concerted response from other generators – see below), if it elects to do so. For example, although 1.5% of trading periods might not seem like a lot, in truth, it is material, i.e., it may be more than enough to give rise to substantial problems if generators act on those opportunities.[42]
- The EA did not examine the potential for the *coordinated* exercise of substantial market power, which could also result in prices above competitive levels. The wholesale market is essentially a 'repeated game' and, through those ongoing interactions, it is conceivable that some of its participants might have found ways to coordinate their conduct in ways that result in higher prices, e.g., by each potentially spilling water over and above the amounts necessary for operational purposes to reduce their future capacity – and, in the process, increasing wholesale prices.

For those reasons, prior to the release of the First Report, questions also remained about the degree of competition in the generation market, including whether margins were reasonable. Most notably, subsequent analyses had indicated that

41 *See for example:* Electricity Authority, *Electricity Market Performance, 2015 Year in Review,* p.51 (see: here).

42 Given the magnitude of potential spot prices during 'net pivotal' situations (e.g., prices of $10,000/MWh or more), a small number of periods of very high spot prices during, say, colder winter months could have a very large effect on the average annual spot price over the long run. For a more detailed examination of the potential exercise of market power in wholesale electricity markets, see: Green et al, *Potential Generator Market Power in the NEM*, A Report for the AEMC, 22 June 2011 (available: here).

Professor Wolak's conclusions regarding the existence of substantial market power, whilst discounted at the time, could not be dismissed so readily. Furthermore, although the EA explored various strategic incentives in recent years (including the incidence of 'net pivotal' trading periods), it neither sought to compare prices and costs at a granular level, nor explored fully the potential for market power to be exercised in other ways, e.g., through tacit coordination.

2.4 Implications

The 2009 Panel found that retail margins often exceeded the levels that might be expected to prevail in a well-functioning, effectively competitive market over the long-term. It also estimated that, on a nationwide basis, wholesale contract prices had, at times, exceeded the estimated cost of new entry for extended periods. That may have been problematic in and of itself – and if the analysis had been undertaken on average spot prices and/or for narrower geographic areas it is possible that other issues may have emerged. Consequently, as at 2009, it is reasonable to state that significant uncertainty surrounded the effectiveness of competition in both the retail and wholesale sectors.

Subsequent analyses did little to assuage those concerns – quite the opposite, in fact. Little substantive analysis was undertaken of the retail sector and several more comprehensive assessments of the wholesale market estimated substantial market power rents. It follows that, when the Panel commenced its review, it arguably had even more cause to be concerned about potential problems in both the retail and wholesale markets than its predecessor. In the following sections, we therefore examine the analysis presented in the First Report and consider whether it provides a sufficient basis from which to garner conclusions about the state of competition in the wholesale and retail markets and to develop policy responses.

3. Assessment of the generation market

The Panel states that strong competition is the vital ingredient in an efficiently operating generation market.[43] We agree. Unfortunately, in our view, the First Report does not contain the types of analyses required to reach reliable conclusions about the degree of competition in the wholesale market. By way of simple comparison, the ACCC's Final Report contained more than 70 pages of in-depth analysis of the wholesale market specifically. That is the same length as the Panel's entire First Report.[44]

That is not always the fault of the Panel. It can in many cases be attributed to a lack of data. Indeed, the ACCC was able to use its information gathering powers to obtain material that the Panel will only be able to receive if industry participants provide it voluntarily. Nevertheless, the upshot is that the potential issues highlighted in the various studies of the wholesale market undertaken since 2009 (e.g., in Browne *et al* (2012), Philpott and Guan (2013) and Poletti (2018)) are not explored sufficiently in the First Report, as we explain below.

3.1 Pricing and profitability

One of the most important indicators of the degree of rivalry in a market is whether prices and margins are consistent with what one would expect to observe under conditions of workable competition – a topic that is addressed in more detail in Appendix A. The First Report contains two key quantitative analyses of wholesale market outcomes in this respect, which we examine in turn.

3.1.1 Analysis of net cash flows

The first empirical exercise presented in the First Report is an analysis of generators' and retailers' net cash flows (as such, the following observations apply equally to the retail sector).[45] Unfortunately, this assessment provides no useful insights into the state of competition in either sector. The following acknowledgement in the accompanying Technical Paper is very telling:[46]

> '*…a comprehensive assessment would require detailed information on the capital and operating costs for generation and retailing activities. This data was not available* [sic].'

Without detailed information on capital and operating costs, it is all but impossible to undertake a robust analysis of generation and retailing margins – and so it has proved in this instance. The Panel's efforts to press ahead despite the dearth of information is admirable but, despite those endeavours, the resulting assessment

43 First Report, p.31.

44 Setting aside the overview and appendices, the First Report is 71 pages.

45 First Report, Figure 20.

46 Electricity Price Review, *Technical Paper to accompany first report*, p.7.

provides no indication of whether generators' or retailers' profits are either reasonable or excessive.

Even in the best of circumstances, an assessment of net cash flows over time does not provide any real indication of whether returns have exceeded the levels one would expect to observe in a workably competitive market. That is because such an exercise is incapable, in isolation, of demonstrating whether:

- either generation or retail prices have exceeded significantly – and sustainably – the LRMC of supply; or
- retail or generation returns have been systematically above the weighted average cost of capital (WACC) required by generators and retailers, given the risks associated with providing their services.

Moreover, the analysis contained in the First Report only illustrates how the overall levels of net cash flows have moved over time. There is nothing meaningful to be gleaned from this assessment regarding the prevailing state of rivalry between retailers, because:

- the Panel presents no evaluation or views regarding the levels it would expect net cash flows to be in a competitive market, e.g., there is no benchmarking against international markets or anything of that ilk; and
- as such, even though the overall level of net cash flows has remained relatively constant since around 2004/05, that does not rule out the possibility that the businesses in question have been earning excessive returns.

Compounding matters, the cash-flow assessment itself exhibits numerous other shortcomings that mean the data themselves are not reliable – again due to a paucity of information. For example, the Panel acknowledges that:

- the analysis does not distinguish between retailing and generation – it is a combined metric, which diminishes further its relevance;
- some of the data include cashflows from gas retailing in New Zealand and generation or retail investments in Australia – both of which are irrelevant; and
- no data exist for the period from 1999-2002.

The upshot is that, although the Panel has found no evidence that generator-retailer profits are excessive, there is also no evidence that they are not. Until more data are provided, it will not be possible to know one way or the other.[47]

3.1.2 Comparison of contract prices and new entry costs

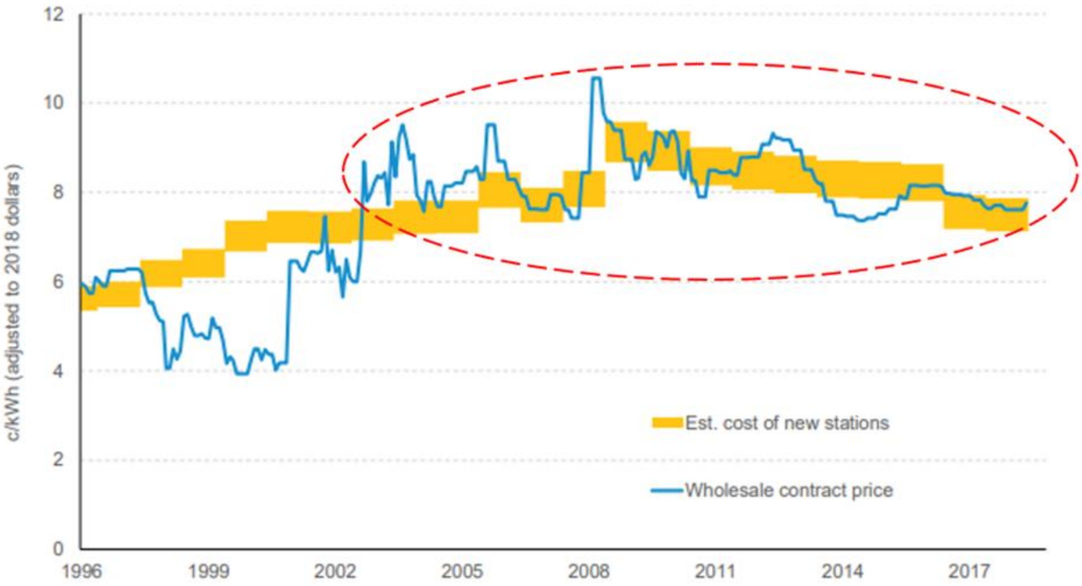
The second quantitative analysis presented by the Panel is an updated version of the comparison between contract prices and new generation costs that was undertaken by its predecessor, i.e., the 2009 Panel (see Figure 2.2 above). The Panel concludes that, because contract prices and new build costs have tracked one another

47 We provide some additional observations on these data availability issues when we set out our conclusions below.

reasonably closely over time, competition appears to have been effective in constraining wholesale prices. However, this analysis exhibits the same limitations as the 2009 assessment, which we described earlier.

First, Figure 3.1 illustrates that,[48] since 2002, contract prices have been comparable to – and often exceeded – estimated build costs. As we explained previously, given the economic characteristics of generation (i.e., its 'lumpiness'), one might have expected to see more sustained periods of contract prices *below* this level if competition was working effectively. At the very least, the relationship observed in Figure 3.1 does not constitute a sound basis for ruling out the existence of any market power problems.

Figure 3.1: Contract prices vs. cost of new generation



Second, the analysis is again undertaken only at a highly aggregated level – and with contract prices. It therefore remains to be seen how the picture depicted in Figure 3.1 might change if the exercise was undertaken using average *spot* prices, which might be affected more acutely by the exercise of short-term pricing power (e.g., periods where nodal prices might exceed, say, $1,000/MWh). Additionally, the outcome might change further if the analysis was undertaken for more granular geographies, e.g., at nodes more prone to pivotal supplier situations.

3.1.3 Implications

To summarise, the Panel's assessments of wholesale pricing and profitability reveals little about the current state of competition. The assessment of net cash flows is, as the Panel effectively concedes, not probative. And, in our opinion, the highly aggregated comparison of contract prices and new build costs does not demonstrate that competition has been effective at restraining prices. Put simply, neither analysis can be relied upon to rule out the existence of substantial market power problems.

48 This is a slightly modified version of Figure 14 from the First Report.

3.2 Transitory pricing power

Despite concluding – without sufficient basis, in our view – that competition has been effective at constraining wholesale prices, the Panel did observe that generators have exercised *transitory* market power by sharply raising prices in the spot market for brief spells.[49] It also noted that:[50]

- the threat of new investment does not restrain prices in these situations; and
- the short-term contracts market can act as a form of insurance against such exposure, making it important that it functions effectively.

We agree on both counts. However, there is another potentially important factor that the Panel might have explored. Specifically, in our view, the way the EA has historically interpreted and enforced the Undesirable Trading Situation (UTS) provisions risks exacerbating the problems associated with the exercise of short-term pricing power.

3.2.1 Application of UTS provisions

A UTS is defined as an extraordinary event which threatens, or may threaten confidence in, or the integrity of, the wholesale market that cannot be resolved under the Code. The most high-profile – and controversial – UTS proceedings have typically involved scenarios in which a generator has found itself pivotal in a region and acted upon the ensuing opportunity to substantially increase its bids and the resulting wholesale price.[51]

One such example was Genesis' bidding conduct on 26 March 2011, when it found itself in a pivotal supplier situation within the Waikato area. That conduct caused spot prices to reach approximately $20,000/MWh over several hours in Hamilton, and regions north of Hamilton, when the national grid operator, Transpower, closed part of the grid to upgrade its lines into Auckland.[52] This was deemed subsequently by the EA to be a UTS.

However, Genesis' conduct was *not* found subsequently to be in breach of any applicable rule or law. Rather, it was the *market outcome* that was found to be unacceptable. Specifically, Genesis' behaviour was found not to constitute manipulative trading activity and it was also deemed to be consistent with managing its own internal risk positions. In response:

- The EA proposed to reset offer prices for 26 March at levels reflecting the cost to purchasers of alternative sources of supply or the cost of curtailing demand. These were the estimated costs purchasers would have incurred to avoid the very high spot market prices had they received accurate price forecasts.

49 First Report, p.33.

50 *Ibid*.

51 A generator is 'pivotal' when it is not possible for total demand in a region to be met without the generation output of that plant.

52 For further details see: here.

- The EA then ultimately set the prices at $3,000/MWh. It believed that this would address the UTS, while preserving incentives for electricity purchasers to hedge their risks from exposure to spot prices. These actions were subsequently upheld by the High Court on appeal.

In other words, this 'market conduct-focussed' approach led the EA to, in effect, apply a retrospective price cap (an approach that was affirmed on appeal). Following the Genesis UTS proceeding, the EA amended the *Electricity Industry Participation Code* (the Code) to include explicit provisions relating to pivotal supplier situations. Criteria were introduced to convey to market participants how they can remain in a 'safe harbour' in such scenarios, thereby avoiding a regulatory response. To qualify for a safe harbour, a generator must:[53]

- offer all its available capacity – energy and reserve – that is able to operate in a trading period;
- act to submit, revise, or withdraw an energy or reserve offer in a timely manner after receiving the information that triggered this action; and
- when it finds itself in a pivotal position, either:
  - prices and quantities in its offers do not result in a material increase in the price in the region where it is pivotal (assessed by comparing prices in the immediately preceding trading period or another comparable trading period in which it was not pivotal);
  - its offers when pivotal are generally consistent with its offers when not pivotal; and
  - it derives no financial benefit from an increase in the price in the region where it is pivotal.

However, the existence of these safe harbour provisions did not discourage Meridian from taking advantage of a net pivotal position to sharply increase spot prices in the South Island on 2 June 2016. When faced with a peak shortage in the North Island – and attendant exposure to its retail load – Meridian submitted bids for its South Island generation units that caused spot prices to reach as much as $4,000/MWh.

This conduct – and the resulting increase in spot prices – prompted retailer Electric Kiwi to allege a UTS had occurred.[54] However, the EA determined subsequently that a UTS had *not*, in fact, taken place – and the prevailing spot prices were permitted to stand. In reaching its decision, the EA stated that:[55]

> *'Meridian's offer behaviour was not an unusual response for a market participant facing the risk of financial loss as a result of the tight and uncertain market conditions that existed in the North Island over the relevant trading periods. There is evidence that a similar approach*

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53 Electricity Authority, *Improving the efficiency of prices in pivotal supplier situations*, 4 June 2014, pp.2-3.

54 For further details, see: here.

55 Electricity Authority, *The Authority's decision on claim of an undesirable trading situation; Electric Kiwi's claim in relation to trading periods 35-40 on 2 June, Final Decision*, 6 July 2016 (available: here).

is also used by other industry participants to manage the risk of financial loss when faced with similar scenarios of basis (or locational) price risk. That this type of offer behaviour has occurred regularly in the past, without creating a UTS, suggested that the behaviour alone was not sufficient to warrant a UTS finding.'

In other words, the EA determined that it was acceptable for Meridian to engage in trading behaviour that, in effect, took advantage of its pivotal position to create a shortage in one location to cover its retail exposure in another. In our opinion, it is questionable whether such conduct would be permitted in, say, the context of a financial market. We note for example that, in a recent presentation to the EA's Market Development Advisory Group (MDAG), Mr Colin Magee of the Financial Markets Authority explained that:[56]

'Trading which created a shortage in one market in order to affect prices in another market would be considered to have an illegitimate purpose, as would trading to push a price up in one market being used to offset losses in another market.'

In our view, the way in which these previous UTS applications have been treated by the EA (and, in the Genesis proceeding, the High Court) does little to dissuade generators from placing very high offers when they find themselves in a pivotal position – even if a UTS is found subsequently to have occurred. This is especially the case if the business in question can point to some form of 'internal risk mitigation' strategy as a potential justification for the behaviour.

3.2.2 Implications

The way the EA has interpreted the UTS proceedings suggests there is little downside to pivotal generators engaging in strategic bidding conduct to engineer short-term price spikes. The 'market-conduct' based approach employed by the EA means the risk of the generator being found in breach of the Code itself is negligible. In all likelihood, the worst thing that might happen is the EA declaring a UTS and retrospectively 'clawing back' some of the resulting financial gains.

Moreover, the Meridian precedent indicates that if a generator can rationalise its bidding conduct by reference to some form of 'risk mitigation' strategy, the EA may determine that no UTS has occurred at all. In our opinion, this is a potentially unwelcome development. It is perhaps for this reason that the MDAG is exploring this matter at present. In our opinion, it would be worthwhile for the Panel to do the same in the next part of its review.

3.3 Vertical integration and contracting

The Panel observes that a new entrant seeking to compete in the generation sector has two choices. The first is to create a natural hedge through an affiliated retail operation to offset its exposure to low spot prices. The second is to remain a 'stand-

56 Market Development Advisory Group, Minutes, Meeting number 6 (available: here).

alone' generation operation and procure reasonably priced financial hedges to cover its risks. There are considerable challenges associated with either approach:

- the first strategy involves entering two markets at once, which raises substantially the costs of entry;[57] and
- the success of the second strategy depends crucially on the performance of the contracts and derivatives market.

It follows that if the contract market is illiquid, thereby exhibiting 'murky' price signals (i.e., wide bid-offer spreads[58]), this can have a substantial adverse impact upon non-vertically integrated generators – many of whom are new entrants. Smaller generators often cite the limited depth of the contract market as the key factor inhibiting their expansion or new entry.[59] To that end, Cumulus Asset Management has observed previously that:[60]

> *'New Zealand stands out to us as having among the lowest levels of wholesale liquidity relative to its size, and one of the highest levels of vertical integration.'*

The Panel points to particular problems that arose during the winter of 2017, when bid-offer spreads spiked as high as 15%.[61] However, the spreads observed *outside* of this window are also high compared to similar markets in other jurisdictions, and to markets for other commodities. For example, Ofgem data on the UK's wholesale electricity market show that spreads for forward contracts typically average 0.5% or less.[62] That is a substantial discrepancy.[63]

For those reasons, in our view, the Panel is consequently correct to single out the contract market as a key area of focus for the next part of its review. We agree that improving the depth and resilience of the contract market is a matter that should be given high priority. Indeed, in our opinion, it is far from clear that the market is performing effectively at present – or at least as well as it could be, given the trends seen overseas.

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57 It is not a simple matter to procure a sufficiently large base of retail customers within a short timeframe – especially given the 'stickiness' exhibited by many disengaged/passive customers (a subject we return to subsequently when we consider the 'two-tier' retail market).

58 Bid-offer spreads are a useful indicator of liquidity, since they indicate the extent to which prices reflect market value. A tight (low) bid-offer spread is likely to indicate there are many participants in the market. Tight spreads should encourage entry, because participants are confident of being able to buy and sell at a fair cost..

59 First Report, p.34.

60 Cumulus Asset Management, *Submission by Cumulus Asset Management on the Consultation paper titled – Hedge Market Development: Enhancing trading of hedge products,* 14 July 2015, p.1. (see: here).

61 First Report, Figure 19.

62 Ofgem, *Wholesale Power Market Liquidity: Annual Report 2016*, Figure 13, p.24 (see: here).

63 This in part reflects the introduction of compulsory market-making obligations in the UK (with regulated bid-offer spreads). However, even prior to the introduction of those obligations, spreads were significantly narrower than in New Zealand.

3.4 Conclusion

The Panel's examination of the generation market is quite limited and provides no basis for it to confident that competition in the generation market is effective. By way of comparison, the ACCC's electricity market inquiry report[64] contained more than 70 pages of in-depth analysis of the Australian wholesale market.[65] In many cases, this is attributably largely to the Panel's lack of data.[66] Nevertheless, the upshot is that the potential problems highlighted in the various studies undertaken since 2009 have not, in our view, been examined sufficiently. For example:

- neither the net cash flow analysis nor the comparison of contract prices and new build costs establishes that prices and margins are consistent with workable competition, i.e., they cannot be used to rule out market power rents;
- the Panel acknowledges the potential for the exercise of transitory pricing power and the EA's interpretation and application of the UTS provisions could exacerbate these problems in the future; and
- the Panel highlights – quite rightly – the importance of hedging instruments in enabling non-vertically integrated generators to compete, but arguably understates the potential shortcomings in the existing price signals.

More work therefore needs to be done before the Panel could conclude reliably that rivalry in the wholesale market is working to constrain prices to competitive levels. Of course, the Panel's ability to undertake those types of analyses will depend largely on the data provided to it by the businesses. Ideally, the Panel will have enough information to explore crucial matters such as:

- the relationship between average spot prices and either new generation costs or LRMC (see Appendix A) in more granular geographic locations over time, consistent with what we described above;
- whether generators' margins differ significantly between vertically integrated businesses and those without natural hedges (i.e., without their own retail loads) and/or across geographies – and how those profits have moved over time;
- the number of trading periods in which spot prices exceeded, say, $300/MWh at any node across the country over time;[67,68] and

64 ACCC, *Restoring electricity affordability & Australia's competitive advantage, Retail Electricity Pricing Inquiry: Final Report,* 11 July 2018, p.59. (hereafter: 'ACCC Final Report').

65 That is the same length as the Panel's entire report, i.e., setting aside the overview and appendices, the First Report is 71 pages.

66 Indeed, the ACCC was able to avail itself of mandatory information gathering powers to obtain material that the Panel will only receive if industry participants provide it voluntarily.

67 Note that the ACCC presented such an analysis in its Final Report. *See:* ACCC Final Report, p.59.

68 Note that this information is not easily obtainable from the EMI dataset – it would require significant work to extract.

- offers and average output by technology[69] and the identity of marginal generators in each region over time by location, generator and fuel type.[70,71]

If adequate data are *not* provided to enable the Panel to undertake these types of analyses, it will undermine substantially the review. Irrespective of whether those data are provided, it may be worth considering imposing additional information disclosure requirements on generators and retailers, compelling them to report bespoke margins for their retail and generation operations in a standardised way. This information might be published, or it could simply be provided to the Commission on a periodic basis for monitoring purposes.[72]

69 *See for example:* ACCC Final Report, pp.56-57.

70 *See for example:* ACCC Final Report, pp.60-65.

71 Again, these data are not readily obtainable from the EMI data service.

72 To that end, we note that the ACCC has recently been given an analogous monitoring role in Australia, whereby it will report periodically on prices and profits throughout the electricity supply chain (see: here).

4. Assessment of the retail market

The Panel devotes considerable attention to affordability issues throughout the First Report. It emphasises especially the potential adverse consequences associated with the 'two-tier' market structure that has emerged in the retail market. We agree that this and other related issues identified by the Panel, such as the effect of conditional discounts and trends in retail costs, should be of significant concern. In our opinion, the potential efficiency and equity problems that may result warrant scrutiny and, potentially, a policy response of some form. We explore these matters below.

4.1 The 'two-tier' retail market

As the Panel notes, recent wide-ranging and high-profile reviews of the electricity sectors in both the UK[73] and Australia have revealed 'two-tier' markets in which the benefits of retail competition have accrued primarily to 'active' customers. Those customers who are willing and able to spend the time and effort required to review the various retail electricity products on offer can often secure much lower prices than those customers who are not. The Panel has observed a similar trend in New Zealand. In our view, this may give rise to significant problems.

4.1.1 Engaged versus disengaged customers

When a New Zealand electricity retail customer's contract is due to expire, she will typically be sent a letter and/or email from her current retailer, advertising the various products it is currently offering and recommending that she gets in touch. If she does not respond to that overture for whatever reason – i.e., she neither explores the alternative offerings of her current retailer nor looks more broadly at other firms' products (e.g., via the 'what's my number' website) – she will then be rolled-over onto a plan without any fixed term (much like the standard variable tariff[74] in the UK or a 'standing offer'[75] in Australia).

Specifically, each retailer has a plan that does not require a customer to agree to a 'fixed term', or to prices that are locked-in for a period (typically from 12- to 24-months). For example, Contact has its 'freedom plan' (see: here) and Genesis has its

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73 *See:* Competition and Markets Authority, *Energy Market Investigation, Final Report,* 24 June 2016 (hereafter: 'CMA Final Report'). The full report is available: here.

74 The SVT is the 'default' plan that UK customers are placed on if they have not selected another deal, e.g., a 'fixed price' plan. SVTs are energy packages where the price per unit is dependent on the base rate of the Bank of England. If the rate goes up, then so do energy prices, but similarly if the rate decreases then users will benefit from lower fuel costs. As such, users of SVTs experience large levels of fluctuation. SVTs are typically the most expensive plans offered by UK retailers and are used most commonly by people whose fixed rate deal has run out and whom have not chosen another plan (i.e., who have defaulted back to the SVT), or by people who have recently moved into a property and not selected another offer. The tariff is for a period of indefinite length: there is no specified termination date, i.e., it is 'evergreen'.

75 Standing offer contracts are basic energy contracts with non-price terms and conditions regulated by governments and enforced by legislation. Like SVTs, they are the 'default' contracts that a customer will be assigned to if she has not selected an alternative 'market based' offer. Critically, Australian retailers are free to set the price of standing offers and they are invariably more expensive than most 'market contracts'.

'no fixed term plan' (see: here). These plans essentially serve as 'default' tariffs for disengaged customers. If a customer's existing contract expires and she does not choose another deal, she will be placed on her retailer's variant of this tariff. From that point forward:

- the customer's retail prices are unlikely to be fixed – the retailer will almost certainly be free to change them depending upon market conditions; and
- the customer will not have a contractual 'expiry date' (the tariff is 'evergreen'), i.e., if she remains disengaged, she will simply remain on that default arrangement year after year.

The financial consequences of reverting to these types of 'default plans' can be stark, since they tend to be among the most expensive in the market. There will almost always be cheaper plans available to customers if they are prepared to shop around – even if all they do is look at the other deals being offered by their current retailers. To be sure, agreeing to a fixed term plan is not entirely riskless (e.g., prices could conceivably drop in the interim, and break-fees may apply if a customer switches before the contract expires), but the potential savings can be substantial.

This begs the question: with such significant savings on offer, why do some customers remain passive? Some customers may have made a deliberate and educated decision to not explore their options, i.e., because they value their time more than the potential savings on offer. That is their prerogative and, some would say, should not be of any cause for concern. But there are several other more problematic reasons for customer disengagement – several of which are identified by the Panel in its First Report. For example:[76]

- Although some passive customers may have made a conscious decision not to engage in the market, it may not have been an *informed* choice. For example, some may think they will only be able to save 'a few dollars here and there' and choose not to explore other options on that basis when, in truth, the potential savings may be far greater.[77] Indeed, some might have considered it well worth their time to shop around if they had known they might save, say, several hundred dollars per year.[78]

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76 Although third-party intermediaries can sometimes mitigate the problems described below by assisting customer navigate the complexities of the market, they are not a panacea. For example, vulnerable customers may be just as ill-equipped to deal with third-party intermediaries as they are to engage in the market directly. Other customers may harbour suspicions – rightly or wrongly – about the motivations of such parties and be reluctant to deal with them (*See for example*: Australian Energy Market Commission, *Final Report, 2014 Retail Competition Review, To COAG Energy Council 12 August 2014*, p.24.). Furthermore, as the ACCC noted recently, such services can add costs to the electricity supply chain through any commissions that they charge to retailers. *See:* ACCC Final Report, p.275.

77 *See for example*: Newgate Research, *Consumer Research for Nationwide Review of Competition in Retail Energy Markets,* report for the AEMC, June 2014, pp.41, 117 and 173.

78 To be sure, it is not unusual for some customers in competitive markets to be less knowledgeable than others. For example, a customer may buy a pair of shoes at a store in the city, unaware of the fact that they are for sale at a considerable discount at the store's factory outlet in the suburbs. However, a potentially important distinction here is that customers *have a choice* about whether to buy a new pair of shoes – they can choose not to do so. But they really have no option but to buy electricity from somewhere – and it can account for a material proportion of their total annual

- Customers may be time poor. For example, a family may often be fully occupied with the myriad other critical aspects of running a household and have little or no time to spare weighing up different electricity offers (especially if it is under the – perhaps mistaken – impression that no significant savings can be made). When renewal letters arrive from electricity retailers, insurance companies and so on, they might therefore be skimmed briefly, then cast aside.
- Some customers may attempt to engage in the market but revert to passivity after becoming disillusioned with its complexity – especially if they attempt to look beyond the prompt payment discounts and lump sum inducements that tend to be the focus of retailers' advertising efforts. A customer seeking details of the individual tariff components they she will be paying under a plan may need to locate inconspicuous weblinks, navigate multiple webpages and, ultimately, decipher complex tables of price elements.
- Among the passive customer group will also be some people who, for a variety of reasons, may find it more difficult to engage with the market. For example, English may not be their first language, or they may be elderly and less confident comparing offers online. These factors can make it much harder for those customers to explore their options. They may, in truth, be highly price sensitive and be willing to invest the time and effort into searching for a new supplier – if only they were able to do so.[79]

We therefore agree with the Panel that there is good reason to think that many New Zealand customers will be disengaged and, consequently, paying significantly higher retail prices than they need to be. Moreover, it cannot be assumed that those passive customers have made a deliberate, informed choice to remain disengaged – thereby consciously accepting the higher prices that result. Rather, there are other more worrisome explanations for customer disengagement. For example, low-income and vulnerable customers are likely to be over-represented amongst the disengaged, given the difficulties they face navigating the market.[80]

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expenditure. A lack of knowledge may therefore be of much more concern when one is dealing with an essential service of this kind.

79 Simshauser and Wish-Wilson (2015) describe this as 'inter-consumer misallocation'. Arguably, this is neither efficient nor equitable. It is not necessarily efficient, since the lower prices being offered to those active customers on cheaper offers – who have shopped around – are being funded, at least in part, by vulnerable customers that may be equally (or more) likely to be on those offers if they were able to switch. Again, this is not a problem that is unique to the electricity retail sector – vulnerable customers will often experience similar challenges when buying products in many competitive markets. However, it might again be said to be particularly troubling in these circumstances, considering the essential nature of the service in question and the potentially large expense involved. *See: Simshauser* & Whish-Wilson, *Reforming reform: differential pricing and price dispersion in retail electricity markets*, AGL Applied Economic and Policy Research, Working Paper No.49, June 2015, p.25.

80 The analysis of switching rates contained in the paper does little, if anything, to assuage those concerns. As the Panel effectively – and rightly – concedes those data are not currently reliable, because it is not known how many of those customers are simply moving houses. And in any case, they do not preclude the existence of a sizeable base of disengaged customers whom retailers can then charge significantly higher prices.

4.1.2 Implications

Widescale customer disengagement can have profound effects on the development of electricity retail market competition. The most obvious consequence of incumbents being privy to a significant base of passive customers is that the market – or, at the very least, a substantial portion thereof – may cease to be what might ordinarily be regarded as workably or effectively competitive. Renowned Australian economist and academic, Professor Maureen Brunt, has described workable competition as:[81]

> *'…a situation in which there is sufficient rivalry to compel firms to produce with internal efficiency, to price in accordance with costs, to meet consumers' demand for variety, and to strive for product and process improvement.'*

As the analysis in Appendix A explains in more detail, if competition is workable then, if average prices are persistently above the long-run cost of supplying a service this should, in time, prompt a supply-side response. Specifically, entry and/or expansion should occur from firms chasing the resulting profits, thereby restoring average prices to levels that reflect long-run costs. However, when a market is characterised by large incumbent suppliers with lots of passive customers, this symbiosis between prices and costs can break down. The New Zealand electricity retail market appears to exhibit these conditions:

- much like in the UK and Australia, New Zealand has several (in this case, five[82]) large electricity retailers who account for the lion's share of the market; and
- it is reasonable to surmise that, just as in the UK and Australia, a significant portion of those retailers' customers are passive (for the reasons set out above).

These structural and behavioural dynamics mean that new entrants and smaller retailers – of which there is a significant number in New Zealand – may be vying primarily for the 'active' customer segment which, by definition, is likely to be especially price sensitive and may offer only relatively low margins. The various factors we described earlier that have contributed to the passivity of the remaining customers may serve as potentially considerable obstacles to those rival suppliers acquiring them – even though they are likely to be the most lucrative targets. This means that larger retailers may be relatively insulated from the threat of competition when it comes to their inert customers.

This may place the big retailers in a strong position to charge those disengaged customers prices that exceed – perhaps significantly – the long-run cost of supplying the services, without having to be too concerned about losing them to rivals.[83] Moreover, if an incumbent does lose a previously disengaged customer to a smaller rival, it is not without options. For example, it may choose to respond by seeking to

81 Brunt, M (1970), 'Legislation in search of an objective', in J.P.Nieuwenuysen (ed.), *Australian Trade Practices: Readings*, Melbourne, Cheshire, p.238.

82 Genesis, Mercury, Contact, Meridian and Trustpower.

83 More specifically, the higher prices charged to passive customers may result in an average price across *all* the retailer's customers that exceeds the long-run cost of supplying them.

win back that customer as soon as possible. Such a response may be worthwhile, even if it necessitates offering the customer a lower price to return, because:

- although the customer may then be paying those lower prices for the term of her contract, if she becomes passive once more, there may be a good chance that she will revert to a more expensive offering once that deal expires; and
- it will have caused the rival retailer to incur acquisition costs for no benefit and, unlike the larger retailers, smaller firms are unable to fund such efforts through the higher prices received from disengaged customers.

Dr John Small went as far as to suggest recently that passive electricity retail customers could constitute a distinct market that could be monopolised.[84] We agree. The factors described above make it entirely plausible that a hypothetical retail monopolist could profitably increase prices above the (theoretical) competitive level,[85] without reducing its overall profitability, implying the existence of a bespoke 'antitrust market'.[86] The ACCC has also highlighted this two-tier dynamic and lamented the adverse consequences for overall retail market outcomes:[87]

> *'…incumbents have benefitted from large parts of their customer bases being inactive or disengaged from the competitive market, often remaining on high-priced standing offers. Incumbents are able to make very attractive offers to retain customers, effectively through cross-subsidies paid by their inactive customer cohort. This has enabled incumbents to compete only selectively, and with a disproportionate focus on efforts to retain profitable customers rather than win new ones. In that environment, new entrants and smaller retailers are competing only for the 'active' part of the market which is price sensitive and only low-margin. This model of competition has not delivered a dynamic and competitive market in which many retailers compete vigorously, driving efficiencies and providing innovative products to attract and retain a broad range of customers.'*

Widespread customer disengagement gives rise not only to potential inefficiencies, but also to legitimate equity concerns. It inevitably results in a transfer of wealth from passive customers – some of whom have little choice but to remain so due to difficulties engaging in the market – to active customers. Although equity is inevitably a subjective concept, in our opinion, many reasonable observers might well regard such a scenario as unfair. Those wealth transfers may also contribute to problems such as energy poverty, e.g., to households being unable to afford to adequately heat their homes.

For those reasons, widespread customer disengagement in the electricity retail market is not something to be dismissed lightly. Even if it is not especially difficult

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84 Small., J (2018), *Competition and Regulation in New Zealand*, prepared for Competition Law and Policy Institute of New Zealand Workshop, 10-11 August, 2018, p.20.

85 Note that this thought experiment must be undertaken using a hypothetical competitive price as a reference point. If the exercise is undertaken using, say, a monopoly price as the starting point then, by definition, no further price increase would be profitable (since the monopolist would already be maximising its profits). One would therefore reach the erroneous conclusion that the market definition needed to be expanded. This is known in economics as the 'cellophane fallacy' (after a famous US case involving the wrapping material).

86 *Supra* note 28.

87 ACCC Final Report, p.xi.

to start an electricity retail business in New Zealand, the two-tier market structure means that the barriers to *expansion* may be considerable, hindering the effectiveness of competition. Most notably, customer disengagement may present opportunities to established retailers to earn excessive profits from their passive customer bases. That is entirely consistent with the retail margin analysis performed by the EC in 2008 (see Figure 2.1).

Recall that this analysis indicated that, at a national level, average margins for incumbent New Zealand retailers were significantly higher than for their Australian counterparts and exceeded significantly those being earned by newer entrants.[88] Moreover, only a few network areas were found to have margins below 8% (the higher of the levels observed in Australia) and many regions had margins above 12%. For the reasons we set out in section 3.1.1., the Panel's analysis of net cash flows does not alleviate the concerns raised about the magnitude of retail margins by its predecessor.

This serves to reinforce the danger of relying upon simple metrics such as market shares and the number of retailers as gauges of the effectiveness of competition. Indeed, it is worth remembering that there are also large numbers of new entrants in the Australian and UK retail markets – yet that did not preclude the respective competition agencies from finding profound competition problems in each instance that warranted policy intervention, including the introduction of regulated retail tariffs (this has been proposed in Australia[89] and has happened in the UK[90]).

4.2 Other retail market issues

The Panel also identified several other potential problems in the retail market that cast further doubt over the effectiveness of competition. For example, as we noted earlier, the analysis of hedging market liquidity set out in section 3.3 applies equally to retailing and raises equivalent concerns. In addition, the prevalence and effects of conditional discounts and the observed trends in retail costs are sources of potential concern worthy of further examination.

88 Ministerial Inquiry Report Volume 2, p.105.

89 The ACCC recently recommended abolishing 'standing offers' (Australia's variant of the default tariff) and replacing them with a regulated tariff to be determined by the AER. The ACCC indicated that the regulated price should reflect the efficient cost of operating in the region, including a reasonable margin as well as customer acquisition and retention costs (*see:* ACCC Final Report, p.252). Note that the ACCC's proposals are still under consideration by the government.

90 On 19 July 2018, the *Domestic Gas and Electricity (Tariff Cap) Act 2018* received royal consent and became law (see: here). The law required Ofgem to place a temporary cap (which will expire in 2020 unless it is extended) on SVTs and default fixed-term tariffs 'as soon as practicable' and to review the level at which the cap is set every six months thereafter. The cap is not intended to replace competition. The objective is to protect passive customers from high prices, whilst ensuring enough cheaper tariffs are offered to engaged consumers. *See:* Ofgem, *Default Tariff Cap: Policy Consultation Overview document*, 25 May 2018, p.7 (available: here).

4.2.1 Conditional discounts

The main way that electricity retailers market their offers is through conditional discounts. For example, a customer may be offered discounts for bundling gas and electricity, paying by direct debit and receiving correspondence by email. But, as the Panel highlights, by far the largest discounts are offered to customer who pay their bills on time. Prompt payment discounts can sometimes exceed 20% and are the main way in which retailers promote their products. These discounts are invariably displayed much more prominently in marketing materials than the underlying tariffs themselves, which are often difficult to find.

Pay on time discounts incentivise consumers to make timely payments of their bills – and that is clearly of some benefit to retailers. Timely payment means that the retailer does not have to spend time and money following-up on unpaid accounts and may conceivably lead to a reduction in bad and doubtful debt expenses. However, it is far from clear that the pay-on-time discounts on offer in the market currently provide an accurate reflection of the size of the savings that retailers are achieving. In our opinion, there is good reason to think that the discounts exceed those cost savings by a substantial margin.

Intuitively, it seems implausible that a retailer would reap a saving equal to, say, 10-20% of a customer's bill if she pays on time. Or, put another way, it does not seem feasible that a retailer would incur a *cost of that magnitude* when a customer pays *late* – at least not on average. The widespread application and magnitude of prompt payment discounts prompted several commentators – including Steve O'Conner, the chief executive of Flick Energy – to suggest that they are little more than late payment fees in disguise.[91] The basic assertion was that:

- the discounted prices (i.e., after the application of prompt payment discounts) represent the *true* standard retail prices of electricity;[92] and
- customers that fail to pay on time are consequently being hit with a penalty that exceeds substantially the cost to the retailer.

This assertion was all but confirmed recently by the CEO of Meridian Energy, Neil Barclay, when he announced that the business would be doing away with prompt payment discounts. Consistent with the analysis set out above, Mr Barclay acknowledged that the magnitude of the discounts being offered exceeded considerably the costs that Meridian was incurring when its customers paid late:[93]

> *'When we looked at the cost of following up to recover debt, it was a fraction of the value of the discount we were taking away. That makes it manifestly unfair.'*

91 Stock., R. 'Claims that electricity "prompt payment discounts" are a late payment system punishing the poor' in *stuff.co.nz,* 17 June 2018 (available: here).

92 In other words, the implicit contention is that if prompt payment discounts were hypothetically prohibited, the undiscounted price of electricity would not increase by a magnitude equal to the discounts that were previously in place – any price rises would be of a small margin.

93 New Zealand Herald, Staff Business, *Meridian Energy axes 'unjustifiable prompt payment discounts*, 17 September 2018 (see: here).

Mr Barclay stated that Meridian would instead start offering 'guaranteed' discounts to *all* its customers. The move is expected to cost the retailer $5 million, which Mr Barclay has said will *not* be recovered from elsewhere in customers' bills (see: here). Again, consistent with the analysis set out above, this suggests strongly that the discounted prices have historically represented the *true* standard retail prices and that revenue from prompt payment discounts has largely been pure profit.

It is also very hard to dispute that these types of conditional discounts – and prompt payment discounts in particular – have had disproportionately adverse effects on passive, vulnerable customers. The Panel has highlighted that this category of customers is far more likely than most to pay their bills late due to financial adversity.[94] Mr Barclay indicated that this was one of the reasons Meridian stopped offering the discounts.[95] In other words, conditional discounts give rise to both efficiency *and* equity concerns.

4.2.2 Retail costs

The Panel notes that, since 1990, a large rise in retailing-related costs has contributed significantly to the observed increase in retail prices. Retailers' reported costs have risen steeply, particularly marketing and information technology related costs – and now exceed substantially the levels observed in Australia.[96] The Panel concludes that retailing charges were the biggest component of residential price rises between 2004 and 2018 (3.5 c/kWh, or 30%).[97] This prompts it to remark that:[98]

> *'Some of the increase may be due to outlays that directly benefit consumers, such as loyalty programme costs, but it is unlikely to account for much of the increase. Retailers' operating costs now exceed the transmission charge component of residential bills (which is 10 per cent). These factors raise questions about what is behind rising retailers' costs, and how to reverse the trend.'*

We agree that significant questions exist regarding what is behind these increases and whether consumers have received any benefits to justify the higher prices they have had to pay as a result. The trend certainly does not reflect what one might typically expect to observe in a workably competitive market. Indeed, rivalry contributing to higher costs and prices does not fit with the usual notion of competition. We therefore agree that this is an area that should be investigated further by the Panel.

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94 First Report, Figures 15 and 19.

95 Mr Barclay observed that: 'Prompt payment discounts were introduced with good intentions, but over time they have come to disproportionately impact those who can least afford to pay their energy costs. They disadvantage customers who are struggling the most' (see: here).

96 First Report, Figure 17.

97 First Report, p.22.

98 First Report, p.40.

4.3 Potential policy responses

In our opinion, the analyses contained in the First Report and set out above suggest there is sufficient basis to consider policy interventions targeted at improving retail market outcomes. For example, several potential steps could be taken to try and address some of the problems arising from the two-tier market structure, including the affordability issues emphasised by the Panel.

4.3.1 Promote greater customer awareness

The least intrusive policy response would be to seek to improve the awareness amongst disengaged customers of the options on offer to incentivise them to explore those alternatives. The public sector can play a key role in any such endeavours. For example, one of the themes to emerge from the Australian Energy Market Commission's (AEMC's) recent retail market reviews in Australia is that customers are more likely to trust information supplied by governments or regulatory agencies.[99] Additional investment could consequently be made in making public price comparison websites (like 'what's my number') as simple as possible and, potentially, available in multiple languages.

Governments and community groups may also be well-placed to increase awareness amongst passive customers – including the vulnerable. For example, those entities might undertake targeted media campaigns (e.g., advertising in different languages, and through local radio and niche newspapers) to promote mindfulness of the potential benefits from shopping around.[100] To that end, the ACCC recently recommended that additional government funding (to the tune of $43 million, market-wide – or $5 per household) be put towards a grant scheme for consumer and community organisations to provide targeted assistance to vulnerable customers to improve energy market literacy.[101]

These consumer engagement strategies may have *some* effect in improving outcomes for passive customers, without giving rise to unintended consequences. Specifically, they may reduce the number of previously disengaged and/or vulnerable customers that remain on more expensive tariffs. But that effect may only be marginal. Indeed, for many years the AEMC has been trying to promote greater customer awareness – through both its annual retail reviews and its consumer engagement blueprint. However, despite those initiatives, the ACCC's recent review of the retail market concluded nevertheless that a large part of the customer base remained disengaged.

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99 See: AEMC, *Final Report, 2014 Retail Competition Review, To COAG Energy Council 12 August 2014*, p.24.

100 Many of these potential steps are set out in some detail in the AEMC's 2013 consumer engagement blueprint. See: *AEMC consumer engagement blueprint.*

101 This targeted support would be designed to help vulnerable consumers to participate in the retail electricity market and choose an offer that suits their circumstances. *See:* ACCC Final Report, p.226.

Customer engagement strategies proved to have a similarly limited effect in the UK. Professor Martin Cave – a member of the Competition and Markets Authority (CMA) – noted that, in the three years leading up to the CMA's Final Report on its energy market investigation (released in June 2016), a wide variety of information remedies and other pressures had been tried[102] and 'had not made a dent' in the proportion of customers on standard variable tariffs.[103] For those reasons, although similar initiatives may be worth pursuing in New Zealand, they may need to be complemented by additional policy steps to 'shift the needle'.

4.3.2 Restrictions on conditional discounts

Another potential means of assuaging the adverse effects of the two-tier market structure is to place some limits on the form of conditional discounts, including discounts for prompt payment. As we explained above, these discounts have substantial adverse effects on disengaged and vulnerable customers. And although Meridian has committed to removing them, it remains to be seen whether other retailers will respond in kind.[104]

In Australia, the ACCC concluded that, although it was important for retailers to be able to incentivise customers to act in ways that reduced retail costs, it was appropriate to place some restrictions on the *size* of conditional discounts. Specifically, it recommended that the magnitude of conditional discounts – such as prompt payment inducements – be limited to the financial savings that a retailer can reasonably expect to make if a consumer meets the relevant criteria. It also concluded that retailers should be able to justify the magnitude of the discount if requested by the Australian Energy Regulator (AER).[105]

In our view, it is worth exploring whether there is merit introducing similar restrictions in New Zealand. Limiting the magnitude of such discounts to the size of the potential savings would ensure that passive, vulnerable customers are not being penalised disproportionately for costs that retailers are not, in fact, incurring when payments are late.[106] Just as in Australia, retailers could also be required to justify the magnitude of the discount if requested by the Commission.

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102 These measures had covered such things as bill formats and customer prompts, barrages of publicity adverse to energy companies concerning the level of their charges, and very large amounts of column inches, TV advertising and other advice devoted to explaining how to switch suppliers. *See:* CMA Final Report, p.1415.

103 This was despite the fact that the SVT was, at that time, more than £300 per year more expensive than the competitive benchmark for a dual fuel customer. *See:* CMA Final Report, p.1415.

104 *See for example:* Bradley, G., 'Genesis Energy says Meridian Energy's tactics unhelpful', *New Zealand Herald,* 9 October 2018 (available: here).

105 ACCC Final Report, p.269.

106 It may also cause retailers to redirect their marketing efforts away from these types of discounts, e.g., it might prompt at least some to emphasis more prominently the unit prices (i.e., per kWh) that they are charging.

4.3.3 Auctions for passive customers

One of the chief potential problems described above is that there may be a large share of the existing retail customer base that is either unable or unwilling (for various reasons) to engage in the market. New entrants may therefore be able to acquire significant volumes of lower-value price-sensitive customers quite quickly by offering cheap deals; but attracting the disengaged customers of incumbents may be a far more painstaking process. Progress on this front may be extremely slow and incremental at best. Put simply, it may be very difficult for newer entrants to win significant volumes of passive customers.

In other markets, opportunities do sometimes arise for rivals to win large numbers of previously passive customers from incumbents. For example, the migration from copper to fibre services in New Zealand and Australia's telecommunications markets presents a rare opportunity for parties historically disadvantaged by the presence of vertically integrated incumbents to secure customers - even the historically disengaged.[107] This raises the question of whether it may be feasible to replicate an analogous 'collective switching event' in the electricity retail sector, i.e., to create more competition for passive customers.

In principle, a 'generational' switching event could be created in New Zealand's electricity retail market through auction processes. The basic concept would be to identify those customers of the bigger retailers who had not engaged in the market for a significant period – many of which will be vulnerable consumers – and to then offer potential competitors the opportunity to present them with an alternative offer. There are many ways to conduct such an auction, but the essential steps might include the following:

- disengaged customers would need to be defined in some manner and identified;
- those customers – or some sub-set of them – would then need to be disclosed to rival retailers, who would be offered the opportunity to present their competing offers, e.g., via an administrative process, with a 'winner' subsequently selected;
- customers might then be sent letters describing the new winning offer (or offers) and the savings that they entail relative to their current deal (presumably based on their historical consumption patterns); and
- those customers might then have a certain number of days to accept or decline the overture, depending upon whether it is 'opt-in' or 'opt-out':
  - if the process is 'opt-in', customers would remain on their current deals unless they accepted the alternative offer; and
  - if the process is 'opt-out', customers might automatically be switched, provided that is estimated to deliver them a cost saving.

107 Once a customer has access to fibre, she will have access to a product not previously available. This introduces a rare 'consideration/re-contracting event' for the entire market of fixed-line customers analogous to, say, the release of Apple's original iphone. Moreover, if the existing copper networks are ultimately decommissioned, passive customers may have no choice but to engage in the market.

The concept of auctioning electricity retail customers is neither new nor unprecedented. In the UK, Ofgem recently conducted a successful 'collective switching trial' for 50,000 disengaged customers[108] (many of whom would have been low-income customers – for more details see: here and here). Encouraged by that success, Ofgem intends to conduct further auctions involving even more disengaged customers in the coming months (a more detailed description of the UK collective switching trial is provided in Appendix B).

Analogous processes also exist in New Zealand. For example, the EA has put in place an administrative process for reallocating customers if their retailer defaults that includes, amongst other things, a two-stage auction process. Although this framework is currently used only when a retailer fails (i.e., when customers have *no choice* but to switch providers), a modified version could be applied to reallocate disengaged customers – indeed, the basic concept is the same (a detailed description of this auction process is contained in Appendix B).

To be sure, various design and implementation challenges would need to be addressed before this policy could be put in place, such as how many auctions to hold, for which areas and for which customers. However, these issues are likely to be addressable, and the effectiveness and practicality of any such auction process could also be tested by running small-scale pilots in the first instance – just as in the UK. For example, a trial could be undertaken in, say, one of the 29 distribution foot-prints throughout the country.

Although this would clearly constitute a significant intervention, it is still relatively 'market-based'. Retailers would effectively be competing to supply a sub-set of the retail market. If designed well, the process could therefore enable disengaged consumers – including the vulnerable – to benefit from competition without incurring the costs of searching and switching whilst, ideally, limiting any unintended consequences on the rest of the market.[109]

4.4 Conclusion

The Panel has identified several potentially significant problems in the retail market. First and foremost, it rightly highlights the 'two-tier' market structure and the potential adverse effects this can have for both efficiency and equity. The two-tier dynamic may present opportunities to established retailers to earn excessive profits from their disengaged customer bases – a group in which vulnerable customers are likely to be overrepresented. This is consistent with the retail margin analysis performed by the EC in 2008 (see Figure 2.1), which indicated that incumbent retailers' profits were very high. Other potential problems include:

108 It also conducted a smaller trial in January 2017, whereby 10,000 disengaged customers were provided with better tariff offers from alternative suppliers by post, see: here.

109 For example, it would be less 'heavy-handed' than, say, introducing regulated retail price caps. Prices would be set via market-forces, not by a regulator with imperfect information.

- the seemingly low levels of liquidity in the hedging market that were described in section 3.3 – the resulting problems apply equally to retailers and generators, and may raise barriers to entry and expansion in both markets;
- the design and application of conditional discounts, which will almost inevitably result in passive, vulnerable customers being penalised disproportionately for costs that retailers are not, in fact, incurring; and
- the unexplained upward trajectory of retail costs, a trend that does not comport with what one might typically expect to observe in a market if competition is working effectively.

This suggests there is enough basis for the Panel to consider policy interventions targeted at improving retail market outcomes. The least interventionist approach would be to seek to improve the awareness amongst disengaged customers of the options available to them and the magnitude of the potential savings on offer. While potentially worthwhile, the main problem with such initiatives is that they may have only a small effect on any underlying problem. Recent experience in both the UK and Australia suggests that these strategies have had only a very limited impact on the level of customer engagement in each location.

Another lighter-handed initiative would be to limit the size of conditional discounts – especially prompt payment discounts – to the size of the potential savings. Such a step would ensure that disengaged and/or vulnerable customers are not being penalised disproportionately for costs that retailers are not, in fact, incurring when those conditions are not met (e.g., when payments are late). The ACCC has recommended precisely this intervention in Australia.

A further option would be to run 'auctions' for disengaged customers to offer other retailers the opportunity to serve them. Although this would clearly constitute a significant intervention it would be 'market-based'. If designed well, the process could enable disengaged consumers to benefit from competition without incurring the costs of searching and switching whilst, ideally, limiting any unintended consequences. It would consequently be less 'heavy-handed' than, say, introducing regulated retail price caps. The effectiveness and practicality of the initiative could also be tested by running small-scale pilots.

Appendix A SRMC, LRMC and pricing

In this appendix we provide a more detailed explanation of some of the core economic concepts discussed at various points throughout this report. Specifically, it contains an explanation of the relationship between SRMC, LRMC and new investments in workably competitive energy-only generation markets.[110]

A.1 Short run marginal cost

In the short run at least one 'factor of production' is fixed, i.e., a firm cannot instantaneously add new production lines to its factory. It is therefore not possible for a firm to increase the quantity of a product that it is supplying by expanding its existing capacity. The only way that firms can increase supply is to use their *existing* capacity, i.e., to produce more with what they already have. SRMC can therefore be thought of as the cost of meeting an incremental change in demand, *holding capacity constant*.[111]

This is often construed simply as the operating and maintenance costs associated with providing the product. At times, that can be correct, but *not always*. When an incremental change in demand can be met through increased supply from existing capacity, the SRMC *will* be equal to the operating and maintenance costs associated with producing those additional units. However, at other times, SRMC can be significantly above the marginal operating and maintenance expenditures incurred serving incremental demand.

Specifically, an important but often overlooked element of SRMC is that, when supply *cannot* expand to match the incremental change in demand, SRMC rises to whatever level is necessary to *curtail* demand to match supply. Specifically, in situations where there is an increased risk of shortages, the costs associated with this demand side component can cause SRMC to rise *well above* variable costs. Importantly, it is during these periods of scarcity that firms can make a contribution to their *fixed costs*, which do not vary with output over the short-term and are therefore not a component of SRMC.

Kahn (1988) offers the example of a bridge that is contemplating charging a toll. The incremental operating, maintenance and capital costs caused by each additional vehicle on the bridge are practically zero but, as Kahn observes:[112]

> *'[W]hat if charging a zero toll would, at certain hours of the day, produce such an increase in traffic that cars lined up for miles at the bridge entrance and a crossing took an hour instead of a few minutes? In that event, the SRMC of bridge crossings, at those times, is not zero. It can be envisaged in terms of congestion: the cost of every bridge crossing at the peak hour is the cost of the delays it imposes on all other crossers. Or it can be defined in terms of*

110 The material in this appendix is drawn largely from: Green et al, *Potential Generator Market Power in the NEM*, A Report for the AEMC, 22 June 2011 (available: here).

111 It can also be specified as the cost that would be avoided by having to meet a slightly reduced level of demand.

112 Kahn (1988), p.87.

opportunity cost: if A uses the bridge at that time, he is taking up space that someone else could use; therefore, the cost of serving him is the value of the space or capacity to others who would use it if he did not.'

In other words, in times of scarcity, the cost of serving one customer must, by definition, include the value foregone by other customers who cannot be served as a result. For example, if Auckland's water supply began to run low, continuing to supply some customers may mean placing restrictions on the usage of others. The costs imposed by those restrictions may be very high and may include costs such as plant losses in residential gardens and parks, reductions in agricultural output, diminished quality of golf courses and higher production costs for breweries. All those costs form a part of the SRMC of serving one customer in circumstances where that implies restricting supply to another.

Although SRMC can be estimated as at any point in time, its magnitude varies from one point in time to another. Its application in the context of decisions affecting the future (such as, following Kahn's example, whether to build a second bridge to relieve congestion) therefore relies as much on probability and expectation as on fact. A forward-looking SRMC is the sum of the various additional costs arising under different scenarios (holding capacity constant), multiplied by the probabilities of these scenarios occurring. Formally, the expected SRMC is given by:

- the SRMC when supply exceeds demand (i.e., operating and maintenance costs), multiplied by the probability that supply exceeds demand; *plus*
- the SRMC when supplies are less than demand (i.e., *including* the costs of shortages) multiplied by the probability that supply is less than demand.

To summarise, SRMC can be defined as the cost of an incremental change in demand, holding capacity constant. Importantly, its estimation takes account of the potential costs of shortages faced by customers. In the event supply cannot expand to match demand, SRMC rises to whatever price level is necessary to curtail demand to match available supply.

A.2 Long run marginal cost

In the long run, all factors of production are variable and so incremental changes in demand no longer need to be met from current capacity alone. Rather, firms have the option of expanding capacity to meet an incremental increase in demand and, equally, of reducing their capacity to meet a slightly reduced level of demand. LRMC can therefore be thought of as the cost of supplying a specified, permanent increment in demand, allowing for future augmentations in supply.[113]

[113] Note that the LRMC of adding capacity (and the LRAC associated with reducing capacity) will be determined by the operating and capital costs associated with the optimal investment profile needed to meet the relevant increment (or decrement, as the case may be) in demand. This may comprise investment by both existing market participants and by new entrants, and, potentially, investment in different production technologies. When the term LRMC is used throughout the remainder of this memo, it should be interpreted in this way, i.e., as the LRMC *for the market*.

In most industries it is not practicable to add capacity in very small increments.[114] Rather, there are often 'economies of scale' associated with augmentations. For example, once a business has purchased land it may make sense to construct a two-storey office building, even if not all that space will be used right away. This is because adding the second storey now will be much cheaper than building it later. Taking the analogy one step further, it is likely to be yet more expensive (in unit cost terms) to add capacity 'room by room'.

In other words, capacity is often added in 'lumps' rather than very small increments. The likely effect of a permanent increment in demand is therefore to *bring forward* the time at which a planned future 'lump' of capacity needs to be added – by firms that are already in the market and/or by new entrants. The LRMC is therefore the costs – both operating and capital costs – associated with undertaking that expansion *sooner than would otherwise be the case* in response to the incremental change in demand, and the associated congestion costs.[115]

This implies that where capacity must be added in 'lumpy units' (rather than in very small increments), this gives rise to *time-dependent fluctuations* in LRMC. Specifically, the LRMC of supply in such a market will be relatively low when capacity utilisation is low and the next capacity expansion is some distance in the future, but will rise as capacity utilisation increases and the timing of the next expansion is nearer. Specifically:

- in the time period immediately following a capacity expansion, the LRMC of the next increment to capacity is low because the value of any potential deferral of that future capacity requirement is relatively low due to the effect of discounting; and
- as spare capacity declines over time and the need to invest in new capacity approaches the LRMC of the next increment to capacity increases, because the value created through any potential deferral is closer in time and so less (negatively) affected by discounting.

In other words, LRMC *changes over time* as new capacity is added. This is because the cost today of, say, bringing forward by one year a $1m investment that would otherwise have taken place in 12 months' time is much greater than the cost today of that same one-year rescheduling applied to a $1m investment expected to be made in 10 years' time, because of the time value of money.[116]

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114 The exception is industries in which assets are highly mobile and capacity can be added in very small increments. In these circumstances, any level of demand can be met by quickly adding (or subtracting) capacity, i.e., there is never any need to curtail demand. Of course, such industries are rarely seen in practice. We explore this in more detail below.

115 To be clear, LRMC does *not* equal the total operating and capital costs associated with that expansion. This is because an incremental increase in demand does not generally result in investment that would otherwise never be required; rather it brings forward the timing of an expansion.

116 Put another way, the *value* today of *deferring* by one year a $1m investment expected to be made in 12 months' time is much greater than the value today of that same one-year deferral applied to a $1m investment expected to be made in 10 years' time.

In summary, LRMC reflects the cost of serving an incremental change in demand in a market, assuming all factors of production can be varied. Importantly, because LRMC is a long run concept, it accounts for the fact that firms have the option of *expanding their capacity* to meet an incremental increase in demand. Measuring LRMC involves estimating the costs involved with undertaking a capacity expansion *sooner than would otherwise be the case* in response to that change in demand.

A.3 Relationship between SRMC and LRMC

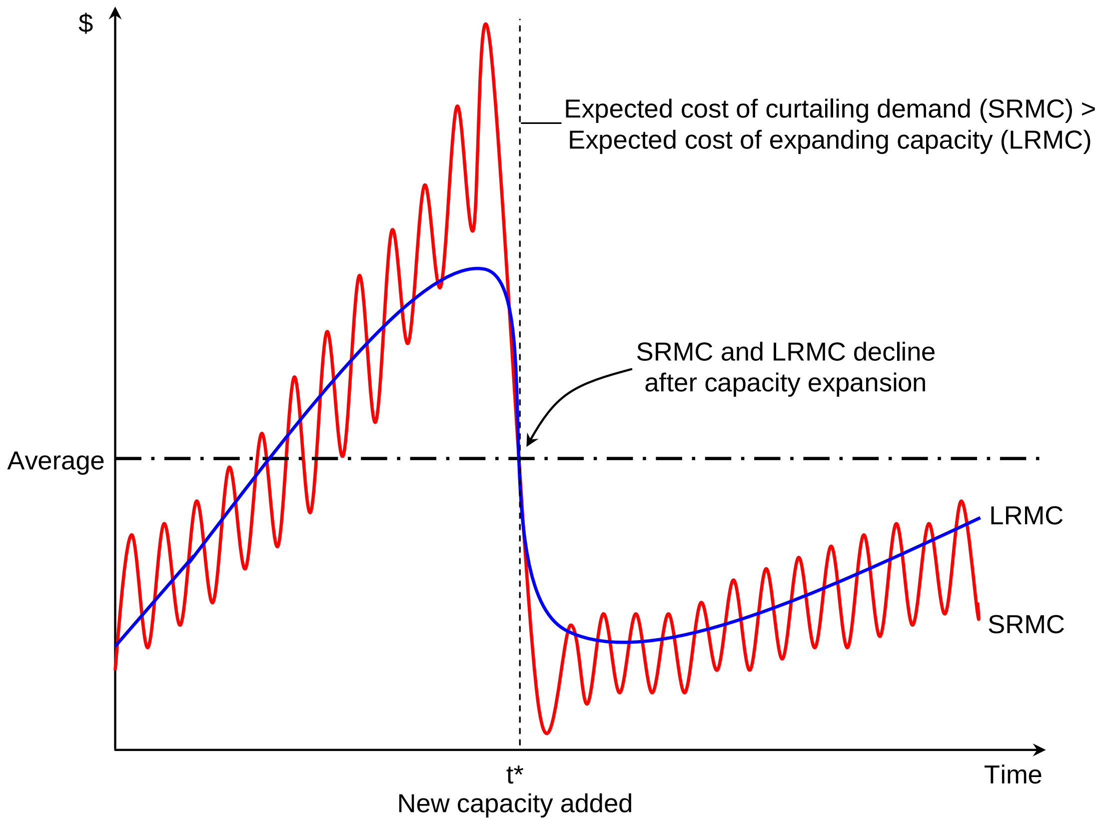
The previous sections explained that SRMC is the cost of an incremental change in demand, holding capacity constant, whereas LRMC reflects the cost of meeting that change in demand assuming capacity can vary. Unless assets are highly mobile and capacity can be added in very small increments – conditions that are rarely seen[117] – there is no reason to expect SRMC and LRMC to be the same *at any particular point in time*. However, there is still a strong 'in principle' link between SRMC, LRMC and capacity expansion decisions.

Specifically, when demand is growing over time, or subject to short term fluctuations, SRMC can be expected to increase to the point at which the cost of curtailing demand exceeds the cost of expanding capacity to *meet* that demand, i.e., when LRMC < SRMC. In the first instance, medium term demand growth can only be met through increased risk of congestion, or the need for demand curtailment during short run peaks. However, there eventually comes a 'tipping point' at which the expected SRMC of *curtailing* demand increases beyond the expected LRMC cost of expanding capacity to *meet* that demand, at which point new investment takes place.[118] This occurs at t*, in Figure A.1 below.

117 When these conditions are present, *there is no distinction* between SRMC and LRMC since, by definition, there is no difference between the short run and the long run. Any level of demand can be met by quickly adding (or subtracting) capacity and so the need to curtail demand never arises. In these circumstances, SRMC and LRMC are always equivalent, and constant at all times. Of course, industries that exhibit such characteristics are rarely seen.

118 The same principles apply to a market in which demand is *declining* over time. In the first instance, declining demand can be met by firms continuing to supply the market with their existing capacity. However, there will again be a 'tipping point' at which the long run costs that would be *avoided* by reducing or redeploying capacity exceed the SRMC of continuing to supply the product at the current level of capacity, at which point capacity is redeployed to other markets where returns are more attractive.

Figure A.1: SRMC, LRMC and capacity expansion



Beyond t* there is significantly more capacity and the probability of shortages emerging that will require demand curtailment is much reduced. SRMC is therefore lower, on average, than during the period leading up to t*. LRMC is also much lower after t* than during the period immediately prior. This is because, beyond t* the LRMC of the *next expansion* is low, because the cost associated with bringing forward that future capacity requirement is relatively small because of discounting.[119]

Of course, in practice, it is often very difficult to time capacity expansions and reductions to coincide perfectly with the emergence of inefficient levels of demand curtailment, i.e., when scarcity is either too common or too infrequent. This is particularly the case when capacity must be added and withdrawn in large increments that alter substantially the supply/demand balance. There may therefore be times when:[120]

119 This is again because the costs that would be incurred today by deferring by one year a $1m a capacity expansion that is expected to be made in 12 months' time are much higher than the costs that would be avoided by undertaking that same capacity reduction in 10 years' time. It follows that LRMC must fall immediately following a capacity expansion, since the next expansion is, by definition, more distant than prior to the investment.

120 Government intervention may also affect the relationship between SRMC and LRMC. For example, government taxes and subsidies can affect the economics of various investment propositions and, potentially, the LRMC of expanding capacity. Such interventions may therefore also influence the time it takes for the SRMC of curtailing demand to reach the new LRMC benchmark.

- SRMC is *above* LRMC for a period as the market waits for new capacity to come on-stream; and
- SRMC is *below* LRMC for a period as the market waits for redundant capacity to be re-deployed elsewhere.

However, such instances of 'misalignment' are neither unexpected, given the imperfections that can affect real world markets, nor a cause for concern, provided that they are transitory. Even accounting for such periods, there is no reason to expect SRMC to differ materially from LRMC, on average, provided they are properly defined and assessed over a sufficiently long timeframe. Equally, although both SRMC and LRMC can fluctuate over time, there is no reason to think that either will diverge over the long term.

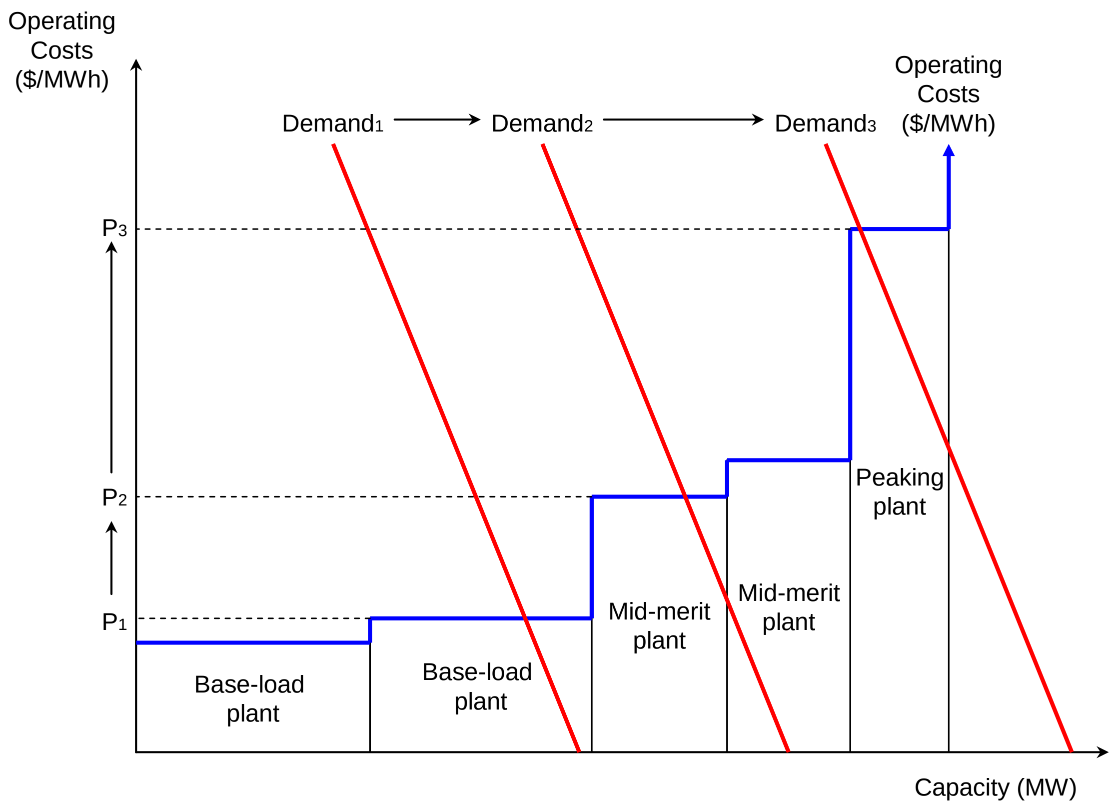
A.4 Application to energy-only wholesale markets

The unusual features of the electricity generation market give rise to highly variable SRMCs. The wholesale market design is directed towards promoting competition between generators that produces prices that reflect those variable SRMCs. Specifically, the expectation is that, most of the time, generation plant should be 'dispatched' according to its economic merit order, as given by the ascending SRMC of running each type of plant (as determined by the respective operating and maintenance costs – the cost of curtailing demand during times of congestion is discussed subsequently).

Although generators are permitted to offer their capacity at any price, the existence of competing offers by alternative plant owners normally constrains the prices that generators can bid. For example, a base load plant that bids substantially above its operating and maintenance costs (or withholds capacity) risks not being dispatched and being forced to incur the expense of shutting down and restarting its plant. For this reason, generators can *generally* be expected to offer to supply the market at a price that reflects their short run operating and maintenance cost and are *generally* scheduled to run in line with their economic 'merit order'.

Figure A.2 below illustrates that, although a generator may offer its capacity at a price sufficient to cover only its operating and maintenance cost, the price that it actually *receives* during a half-hour period is equal to the offer of the last generator that is dispatched in order to meet demand (the marginal generator). This means that generators with lower running costs (base load and mid-merit plant that is 'infra-marginal') will make a profit from the market prices set at the highest bid that enables them to make a contribution to their fixed investment costs. But how does the *marginal generator* cover its investment costs? The answer is no different from that in any other workably competitive market.

Figure A.2: Economic merit order



Specifically, when there is a possibility that the existing generation capacity will not be able to meet demand, prices in the market must rise to reflect the increased SRMC of curtailing that excess demand. In situations where there is a risk of shortages, the costs associated with this demand side component can cause prices to rise *well above* the operating and maintenance costs of the marginal generator. It is during these periods of scarcity that those generators can make a contribution to their *fixed costs*. Indeed, this is the *only way* that such plants can cover their capital costs in an energy-only market.

The expected spot price is therefore based on a probabilistic assessment of possible future outcomes and the costs they entail. Specifically, it is the sum of the various additional costs arising under different scenarios, multiplied by the probabilities of these scenarios occurring. Formally, the expected spot price is derived using the same formula described above:

- the SRMC of the marginal generator when supply exceeds demand (i.e., operating and maintenance costs), multiplied by the probability of that scenario occurring; *plus*
- the SRMC of the marginal generator *plus* the SRMC of curtailing excess demand when supply is less than demand multiplied by the probability of that scenario occurring.

In electricity generation markets, the cost of curtailing demand is termed the 'value of lost load' (VoLL) and reflects the amount that customers would be willing to pay to avoid a disruption to their electricity service. For large industrial users (e.g., an aluminium smelter) that amount may be very high. The expected spot price can therefore be expressed as follows:[121]

Expected Spot Price = [(1 – LOLP) x SMC] x [LOLP x VoLL]
Where:
LOLP = Loss of load probability
SMC = System marginal cost, ie, the SRMC of the marginal generator
VoLL = Value of lost load

When the probability of shortage is low, prices can be expected to resemble the operating and maintenance costs of the marginal generator (often a base-load or mid-merit plant). However, as the probability of a shortage begins to increase (which will happen once demand starts to approach the 'outer limits' of the merit curve), spot prices start to increase above this level and begin approaching VoLL. In the extreme scenario in which a shortage is certain (i.e., if the LOLP = 1), the expected spot price *is* VoLL and a price equal to that level should transpire for the period in question (although, in practice, most regulators place a cap on how high the spot price can rise).

Periods of high prices are necessary to cover generation costs in the aggregate, to ration demand and, critically, to provide an *inducement for new investment* by firms chasing those high prices. Indeed, when scarcity in the market causes spot prices to increase high enough, or frequently enough that the average spot price exceeds the LRMC of constructing additional capacity[122] over that timeframe then:

- firms already in the market have an incentive to expand their generation capacity to take advantage of those periods of high prices; and
- new firms have a stronger incentive to enter the market and offer new generation capacity, chasing those high prices.

In other words, provided that the electricity market is workably competitive, the period over which spot prices rise to reflect the increased risk of congestion, or the need to curtail demand, is finite. Specifically, once the cost of that curtailment (as represented by SRMC) has risen to a level that exceeds the costs of adding capacity (as represented by LRMC), entry and expansion can be expected to occur over the longer-term to *meet* that demand.

In this respect, a workably competitive wholesale electricity spot market functions no differently from most other workably competitive markets. Specifically, any

121 Hunt & Shuttleworth (1996), *Competition and Choice in Electricity*, Wiley, p.173.

122 The LRMC of adding capacity is determined by the operating and capital costs associated with the optimal investment profile need to meet the relevant increment in demand. This may comprise investment by both existing market participants and by new entrants, and, potentially, investment in different production technologies. For example, depending upon the circumstances, the most efficient expansion profile may involve investment by both existing generators and new entrants, and a mix of generation technologies, e.g., base-load, mid-merit and peaking plant and, potentially, transmission and interconnector capacity.

change in market conditions that results in prices that are significantly and persistently *above LRMC* should, in time, prompt a supply-side response that restores prices to these levels. Of course, this supply-side adjustment process cannot necessarily be expected to be *perfect*. Because generation capacity cannot be added or removed in 1MW increments, it can be difficult to time 'lumpy' capacity expansions and reductions to coincide with the theoretical 'trigger point'.

Specifically, there may be times when average spot prices (and SRMC) are *above LRMC* for periods, as the market waits for the next increment of capacity to come on-stream. In other words, prices that diverge from LRMC for significant periods of time may *still be explicable* in an electricity generation market. However, provided competition in the market is at least workable and the concept of LRMC is properly understood, these periods of 'misalignment' should still only be temporary.

Appendix B Collective switching processes

One of the potential solutions to the 'two-tier' market problem that we have suggested the Panel explores in the second phase of its review is an auction process for disengaged customers – a group that is likely to contain many of the consumers experiencing affordability problems. The concept of auctioning electricity retail customers is neither new nor unprecedented. Below, we provide two case studies: one from the UK and another from New Zealand.

B.1 UK collective switching trial

Following its lengthy investigation of competition in the UK electricity retail market, the CMA recommended (amongst other things) that Ofgem establish a 'Disengaged Customer Database'.[123] The six large suppliers (the 'big six') were consequently compelled to give Ofgem the contact details of those of their customers that had been on SVTs for more than three years. From February to April this year, Ofgem then ran a 'collective switch trial' involving 50,000 of those passive customers. The process was run as follows:[124]

- 50,000 disengaged customers (i.e., those who had been on SVTs for at least three years) of Scottish Power (one of the big six) were selected at random;
- those customers were contacted and given the opportunity to 'opt out' of having their personal potential cost savings calculated by the Ofgem-appointed 'consumer partner organisation', Energyhelpline;[125]
- Energyhelpline then went to the market and asked retailers what they would be prepared to offer to supply those disengaged customers, i.e., there was an exclusive tariff negotiated by Energyhelpline on behalf of those customers;[126]
- that exclusive tariff was ultimately one offered by E.ON – another member of the big six – presumably on the basis that it was the lowest price or offered the best deal for most of the customers in the group;[127]

123 Details of Ofgem's disengaged customer, including high-level descriptions of each of its various initiatives are available: here.

124 An Ofgem PowerPoint presentation providing an overview of the collective switch trial is available: here.

125 It is unclear how many customers chose to opt out of the trial.

126 Although it is unclear, it appears that rival retailers had to bid for *all* those disengaged customers collectively (i.e., make the *same* offer to *all* of them). It is also not obvious whether there were any limitations on the terms and conditions that needed to be offered, e.g., whether offers had to be for a certain term (e.g., 2-year deals), whether a certain price structure had to be offered, if prompt payment discounts (or late fees) had to be included. However, the most likely scenario is that each retailer was required to comply with a standard suite of conditions to ensure that offers were reasonably consistent and comparable.

127 No clear explanation is offered for why Energyhelpline chose the E.ON offer for the 50,000 customers, e.g., whether it was based on the largest collective savings across that group, or creating savings for the largest number of customers within the group.

- customers then received a letter[128] outlining the potential cost savings to be made if they took the E.ON deal, and supplying details of how to switch to that offer online or over the phone – links were also supplied to enable them to undertake a wider search comparing other market tariffs; and
- it was then up to customers to decide whether to switch, i.e., this final step was 'opt-in' – they did not have to 'opt out' of being switched to, say, the exclusively negotiated tariff.

Ofgem labelled the trial its most successful initiative to date,[129] with 22.4% of customers switching – around half of whom chose the exclusive tariff negotiated by Energyhelpline (i.e., the E.ON deal). Customers who switched to the exclusive tariff were estimated to save around £300, on average.[130] On the strength of those results, Ofgem has decided to launch two larger scale trials (presumably involving more than 50,000 customers) in the northern autumn, i.e., around September.

B.2 The EA's process for managing defaulting retailer situations

When a retailer goes out of business in New Zealand (i.e., when it 'defaults'), the EA oversees a process[131] whereby it notifies the customers of the failed retailer and urges them to choose another. If some customers fail to switch then, after 14 days, the EA begins to assign them to new retailers – first by running a two-stage tender process and then by mandatory allocation. The EA first invites other traders to tender for the remaining customer base. The tender is held on the following terms:

- All retailers are invited to submit a bid for all or some of the customers of the firm in default. The terms offered by the recipient retailer must be its standard tariff at the date the EA was notified of the default or a lower price.
- The EA allocates customers randomly to the retailer bidding the lowest price according to the quantity it bid; and then to the retailer with the next lowest price, and so on until all customers are assigned, or no bids remain.
- Customers are assigned on the terms and conditions established through the tender (including price), not the terms and conditions of the retailer in default.
- The recipient retailers have the option to notify changes to their terms and conditions (including price) according to their standard process. Similarly, customers have the option to switch to a different retailer at any time.

If there are still some unassigned customers following the first auction, the EA may then invite all retailers to submit a bid based on a fixed term offer:

128 It is unclear whether this letter was from Energyhelpline, E.ON, Ofgem or Scottish Power.

129 Ofgem's letter to stakeholders describing the findings of its collective switch trial is available: here.

130 Savings were not estimated for customers who switched to other market offers.

131 *See:* EA, *Guideline for managing trader default situations,* Version 1.1, 9 June 2015 (available: here).

- the price must be either the retailer's standard tariff or a lower price, but for a fixed term; the fixed term is intended to provide the retailer with certainty about recovering the economic costs of acquiring the customer;
- customers are randomly allocated to the trader bidding the lowest price weighted by the length of the fixed term (price multiplied by the length of the fixed term measured in days), and so on; and
- customers have a two-week grace period to change retailers but, after that period has lapsed, they may be required to pay the economic costs of exiting if they terminate the fixed term contract early.

If the two-stage tender process does not result in all customers being allocated to a new retailer, the EA will assign those that remain to retailers servicing customers in the same network area (or areas) based on their market shares, e.g., each retailer's share of installation control points (ICPs) for each metering installation category (i.e., category 1, 2 and 3 and above).

Although this framework is currently only used when a retailer fails (i.e., when customers have no choice but to switch providers) a modified version could be applied to reallocate disengaged customers. Indeed, the basic concept is the same, and so the EA's existing guideline could be used as a useful blueprint.